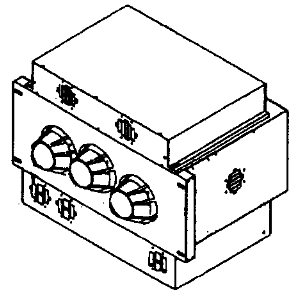
Service Manual

PIONEER®
The Art of Entertainment



ORDER NO.
ARP2913

MULTIPROJECTION UNIT

RM-V2400NA
RM-V2500NA
RM-V2400NE
RM-V2500NE

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model				Power Requirement	Remarks
	RM-V2400NA	RM-V2500NA	RM-V2400NE	RM-V2500NE		
LU/CA	○	○	—	—	AC 100V - 120V	
WGWZ	—	—	○	○	AC220V - 240V	

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This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTES
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

1. SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis or picture tube.
The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled.
   Keep picture tube away from the body while handling.
2. When service is required, even though the PROJECTION UNIT an isolation transformer should be inserted between power line and the set in safety before any service is performed.
3. When replacing a chassis in the set, all the protective devices must be put back in place, such as barriers, nonmetallic knobs, adjustment and compartment covershields, isolation resistor-capacitor, etc.
4. When service is required, observe the original lead dress.
   Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.
5. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacture's.
   Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced set to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the set by the manufacturer has become defective, or inadvertently defeated during servicing.

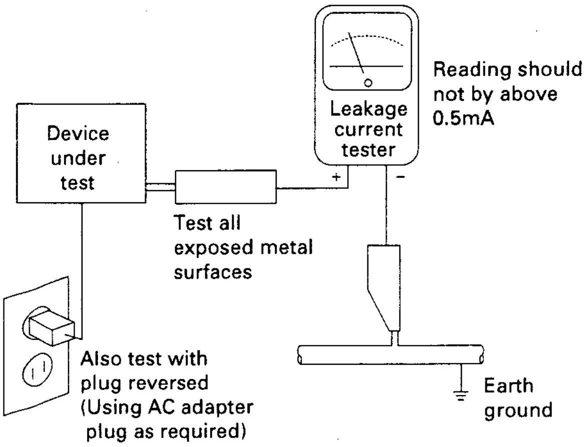
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

Leakage Current Cold Check

With the AC plug removed from an AC power source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC 500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (input/ output terminals, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3MΩ and a maximum resistor reading of 5MΩ. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into an AC power source (do not use an isolation transformer for this check). Turn the AC power switch on.
Using a "Leakage Current Tester (Simpson Model 229 equivalent)", measure for current from all exposed metal parts of the cabinet (input / output terminals, screwheads, metal overlays, control shaft, etc.), particularly any exposed metal part having a return path to the chassis, to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not by above 0.5mA
Device under test
+
-
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE SET TO THE CUSTOMER.

High Voltage

This set is provided with a X-ray protection for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this X-ray protection may correctly by operated.

Serviceman Warning

In the status of the black picture (video muting is being applied) when no signal is input, high voltage of this set during operation is less than 30.9kV. In case any component having some relation to the high voltage is replaced, confirm that the high voltage is lower than 30.9kV in the status of the black picture when no signal is input.
To measure H.V. use a high impedance H.V. meter. Connect (-) to earth and (+)to the FBT anode cable connector.
(Refer to page 90)

X-radiation

TUBE: The primary source of X-radiation in this set is the picture tube.
For continued X-radiation protection, the replacement tube must be the same type as the original, PIONEER approved type.
The picture tube (the CRT assy R, G, B) use in this set holds complete guarantee against X-ray radiation when the X-ray is sealed (See page 4). Accordingly, when the current in flowing to the picture tube be sure to perform it by putting the tube into X-ray sealed applied state. Avoid absolutely to flow the current to the picture tube itself. Moreover, when the voltage of the high voltage circuit becomes abnormally a little higher, the picture tube radiates X-rays. Accordingly, when servicing the high voltage circuit be sure to replace as an assembly with the POWER SUPPLY assy in the manner in which has been adjusted to perform normal operation.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in PIONEER set have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.
Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.
Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

3. CHARGED SECTION, HIGH VOLTAGE GENERATING POINT AND X-RAY PROTECTION

■ Charged section

The places where the commercial AC power is used without passing through the power supply transformer. If the places are touched, there is a risk of electric shock. In addition, the measuring equipment can be damaged if it is connected to the GND of the charged section and the GND of the non-charged section while connecting the set directly to the commercial AC power supply. Therefore, be sure to connect the set via an insulated transformer and supply the current.

1. AC power cord
2. AC inlet
3. AC power switch (S1)
4. AC outlet
5. Fuse
6. STB transformer and Converter transformer
7. Other primary side of the AC POWER assembly

For the places, refer to the EXPLODED VIEWS ,the SCHEMATIC DIAGRAM and the PCB CONNECTION DIAGRAM sections.

■ High voltage generating point

The places where voltage is 100V or more except for the charged places described above. If the places are touched, there is a risk of electric shock.

1. POWER SUPPLY assy	(135V)
2. R. CRT DRIVE assy	(10.5kV)
3. G. CRT DRIVE assy	(10.5kV)
4. B. CRT DRIVE assy	(10.5kV)
5. H.V assy & DEFLECTION assy	(30.5kV,220V)
6. CRT assy R	(30.5kV)
7. CRT assy G	(30.5kV)
8. CRT assy B	(30.5kV)
9. Focus variable resistor(VR1)	(10.5kV)
10. Deflection yokes (L1, L2 and L3)	Approx. 1100V at peak

■X-ray protection

- Regarding the parts which are relative to radiation of X-rays (There is the danger to radiate X-ray from the each CRT assy R, G, B), there are notifications of caution in the individual schematic diagrams. Be sure to read them for safety's sake.
- The component parts for X-ray protection are as follows : When the current flows to the CRT assy , be sure to perform it with these parts being attached. Protection from the X-ray radiation is maintained in the state in which these parts have been installed to the CRT assy. Accordingly, never supply current only to the CRT assy.
  Moreover, the anode voltage of the CRT assy should always be kept not higher than the predetermined value (in the minimum brightness and picture state when non signal input is higher than 30.9kV). Be sure to drive the CRT assy by using a completely functional POWER SUPPLY assy which have been adjusted completely in the combined state. (When the voltage abnormally becomes high, the X-ray protection circuit will operate.)

1.The each CRT assy (Never disassemble .)
2.The each Lens assy

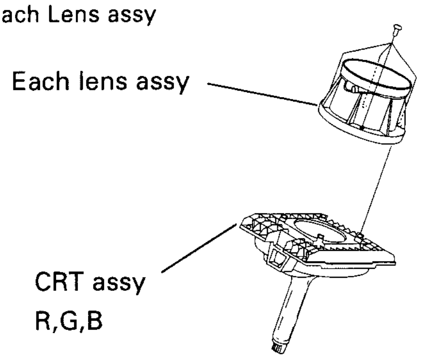


Fig. 3-2 Component parts for X-ray protection

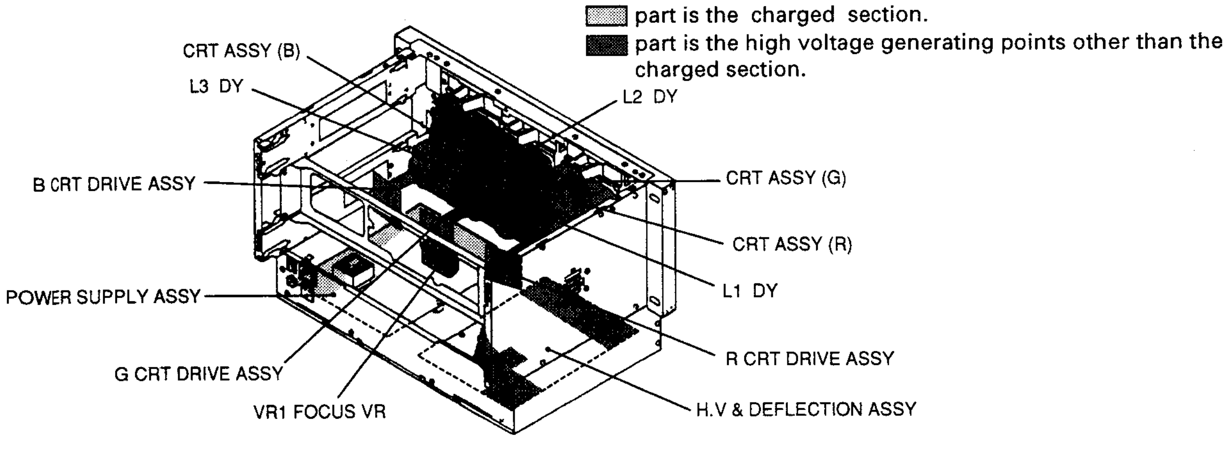


Fig. 3-1 Charged section and high voltage generating point

4. PACKING, EXPLODED VIEWS AND PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *Parts marked by ☆ are important parts which relate to X-rays radiation.*
  If any of these parts need to be replaced, always replace with specified parts.

Parts List

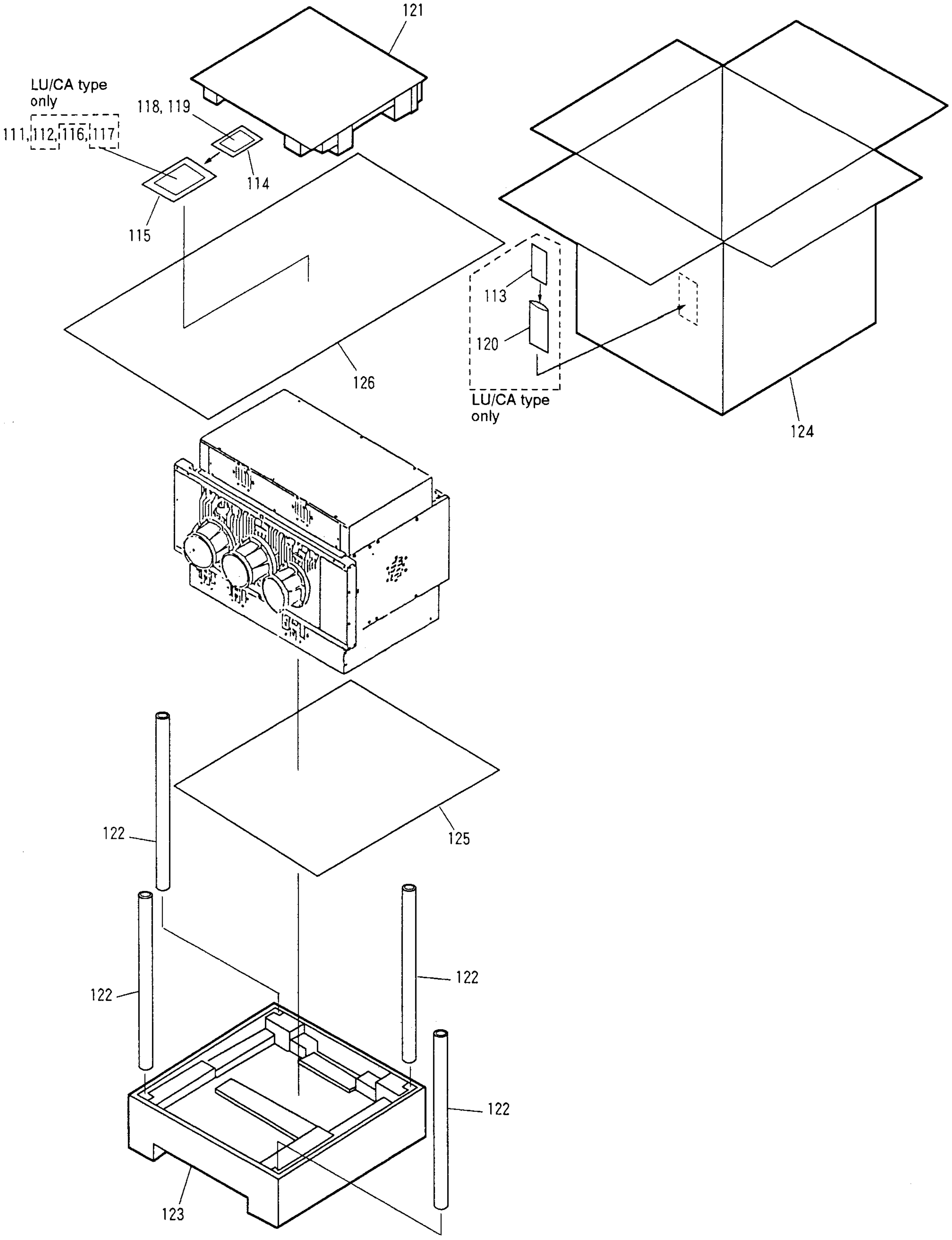
Mark	No.	Description	Part No.
	1	CONTROL ASSY	BWV1039
	2	VIDEO ASSY	BWV1040
	3	H.V & DEFLECTION ASSY	BWV1041
	4	CONVERGENCE ASSY	BWZ1643
	5	CONV. MODULE(RH)	BWZ1644
	6	CONV. MODULE(RV)	BWZ1645
	7	CONV. MODULE(GH)	BWZ1646
	8	CONV. MODULE(GV)	BWZ1647
	9	CONV. MODULE(BH)	BWZ1648
	10	CONV. MODULE(BV)	BWZ1649
	11	CONV. AMP ASSY	BWZ1650
	12	R CRT DRIVE ASSY	BWZ1651
	13	G CRT DRIVE ASSY	BWZ1652
	14	B CRT DRIVE ASSY	BWZ1653
	15	REAR LED ASSY	BWZ1654
	16	FAN INTERFACE ASSY	BWZ1655
	17	POWER SUPPLY ASSY(LU/CA)	BWV1044
		POWER SUPPLY ASSY(WGWZ)	BWV1045
⚠	18	VR1 FOCUS VR	ACX1062
⚠	19	C1,C2 CAPACITOR (1500pF/AC250V)	ACG7002
⚠	20	L1-L3 DEFLECTION YOKE	ATL1068
⚠	21	S1 SEESAW SWITCH	BSM1008
⚠	22	CN1 1P AC OUTLET(LU/CA)	AKP1079
⚠		CN1 1P AC OUTLET(WGWZ)	AKP1088
⚠	23	AC INLET 1-P	AKP1089
⚠	24	FUSE HOLDER	BKR1003
⚠	25	FU5000 FUSE(6.3A/125V) (LU/CA)	AEK-309
⚠		FU5000 FUSE(T6.3AH/250V) (WGWZ)	AEK1039
⚠	26	FU5001 FUSE(500mA/125V) (LU/CA)	AEK1010
⚠		FU5001 FUSE(T250mAL/250V) (WGWZ)	AEK-503
⚠	27	FU6003 FUSE(500mA/125V) (LU/CA)	AEK1010
⚠		FU6003 FUSE(T500mAL/250V) (WGWZ)	AEK-505
⚠	28	FU6001 FUSE(4A/125V)(LU/CA)	AEK1018
⚠		FU6001 FUSE(T4AH/250V)(WGWZ)	AEK-514
⚠	29	FU6002 FUSE(4A/125V)(LU/CA)	AEK1018
⚠		FU6002 FUSE(T4AH/250V)(WGWZ)	AEK-514
⚠	30	FU1 FUSE(10A/125V)(LU/CA)	AEK1035
⚠		FU1 FUSE(T6.3AH/250V)(WGWZ)	AEK1039

Mark	No.	Description	Part No.
	31	J1 4P HOUSING WIRE	ADX1610
	32	J2 1P WIRE	ADX1764
	33	J11 2P HOUSING WIRE	BDX1261
	34	J12 3P HOUSING WIRE	BDX1272
	35	J13 WIRE HARNESS	BDX1341
	36	J14 5P HOUSING WIRE	BDX1342
	37	J15 12P HOUSING WIRE	BDX1343
	38	CHASSIS	BNA1067
	39	CRT STAND H	BNA1068
	40	CRT STAND V	BNA1110
	41	ENGINE CHASSIS	BNA1111
NSP	42	PCB CHASSIS D	BNA1112
NSP	43	POWER.DEF. CHASSIS	BNA1113
NSP	44	FRONT PANEL	BNB1083
	45	REAR PANEL A	BNC1087
	46	REAR PANEL B	BNC1088
	47	REAR PANEL D(LU/CA)	BNC1091
		REAR PANEL D(WGWZ)	BNC1090
	48	REAR PANEL C ASSY	BNC1093
NSP	49	ENGINE FRAME	BND1050
NSP	50	RAIL CHASSIS	BND1051
NSP	51	RAIL FRAME	BND1052
NSP	52	VIDEO PCB STAY B	BNG1062
NSP	53	CRT HOLDER A	BNG1160
NSP	54	CRT HOLDER B	BNG1161
	55	GUIDE RAIL	BNG1166
	56	RAIL	BNG1167
NSP	57	REAR PANEL FLAME	BNG1242
NSP	58	PCB FLAME A	BNG1243
NSP	59	PCB FLAME B	BNG1244
NSP	60	PCB HOLDER A	ANG-516
NSP	61	VR HOLDER	ANG1404
NSP	62	FRAME 3	ANG1784
	63	HOLDER	ANG1839
NSP	64	EARTH PLATE A	ANG1957
	65	FAN HOLDER B	BNG1163
	66	NET B	BNG1165
NSP	67	COVER	BNK1046
	68	• • • • •	
	69	NYLON BINDER	AEC-093
NSP	70	PCB HOLDER	AEC1097
NSP	71	CUSHION	AEC1118
NSP	72	PURSE LOCK S	AEC1261
	73	PURSE LOCK	AEC1540
NSP	74	PURSE LOCK L	AEP-214

RM – V2400NA, RM – V2500NA, RM – V2400NE, RM – V2500NE

Mark	No.	Description	Part No.
	75	BINDER	AEP-215
	76	PUSH RIVET	BEC1080
NSP	77	CABLE CRIP	BEC1088
NSP	78	PC SUPPORT	BEC1117
NSP	79	PCB HOLDER	BEC1118
NSP	80	FREE PROTECTION	BEC1119
NSP	81	CARD SPACE A	BEC1120
NSP	82	CARD SPACE B	BEC1121
	83	PVC SEAT B	BMR1042
☆	84	LENS ASSY 40 (RM-V2400NA/LU/CA AND RM-V2400NE/WGWZ)	AMR2483
☆		LENS ASSY 50 (RM-V2500NA/LU/CA AND RM-V2500NE/WGWZ)	AMR2482
	85	SCREW (STEEL)	ABA1006
	86	SCREW	ABA1099
	87	SCREW	ABZ30P080FZK
	88	SCREW	ABZ30P120FZK
	89	SCREW	AMZ40P060FZK
	90	SPACER B	BBE1012
	91	SPACER C	BBE1013
	92	SCREW	BBZ30P060FMC
	93	SCREW	BBZ30P080FZK
	94	SCREW	BBZ40P080FZK
	95	SCREW	BMZ26P040FZB
	96	SCREW	BMZ30P060FZK
	97	SCREW	FBT40P080FZK
	98	BOLT	HMF40P060FMC
	99	NUTS	NB40FMC
	100	SCREW	PMB40P080FMC
	101	SCREW	PMB40P350FZB
	102	SCREW	VPZ40P120FMC
	103	SHIELD COVER	ANH1166
	104	FINGER GUARD	BEF1017
	105	FAN MOTOR	BXM1006
	106	BONNET	BNE1051
☆	107	CRT ASSY (R)	BWY1014
☆	108	CRT ASSY (G)	BWY1015
☆	109	CRT ASSY (B)	BWY1016
	110-a	FUSE INDICATED LABEL(WGWZ)	BAX1103
	110-b	FUSE INDICATED CARD (WGWZ)	AAX1582
	111	OPERATING INSTRUCTIONS(LU/CA) (JAPANESE/ENGLISH/FRENCH)	ARD1014
		OPERATING INSTRUCTIONS(WGWZ) (ENGLISH/FRENCH/GERMAN/ITALIAN/SPANISH)	BRE1014
	112	UL SAFE CARD(LU/CA ONLY)	BRH1003
	113	REGISTRATION CARD(LU/CA ONLY)	BRY1012
NSP	114	VINYL BAG	AHG-064
NSP	115	LITERATURE BAG	AHG-117
	116	CORD WITH PLUG(6P MINI DIN)	BDE1020
⚠	117	AC POWER CORD(LU/CA ONLY)	BDG1025
NSP	118	CABLE CLIP	BEC1030
	119	SCREW	CBZ30P080FZK
	120	VINYL BAG(LU/CA ONLY)	PHL1006
	121	UPPER PAD	BHA1104
	122	PAPER PIPE	BHA1109
	123	UNDER CARTON	BHD1314
	124	UPPER CARTON(LU/CA)	BHD1320
		UPPER CARTON(WGWZ)	BHD1313
	125	MIRROR MAT A	BHG1038
	126	MIRROR MAT B	BHG1039
	127	• • • • •	
	128	X RAY SHIELD	ANF1080
	129	• • • • •	
NSP	130	LEAD CLAMPER	AEP-329
	131	ANODE CABLE	ADY1012
	132	FUSE INDICATED CARD B (LU/CA ONLY)	BAX1064
	133	FUSE INDICATED CARD (WGWZ ONLY)	AAX1589

4.1 PACKING


LU/CA type only
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111, 112, 116, 117
LU/CA type only

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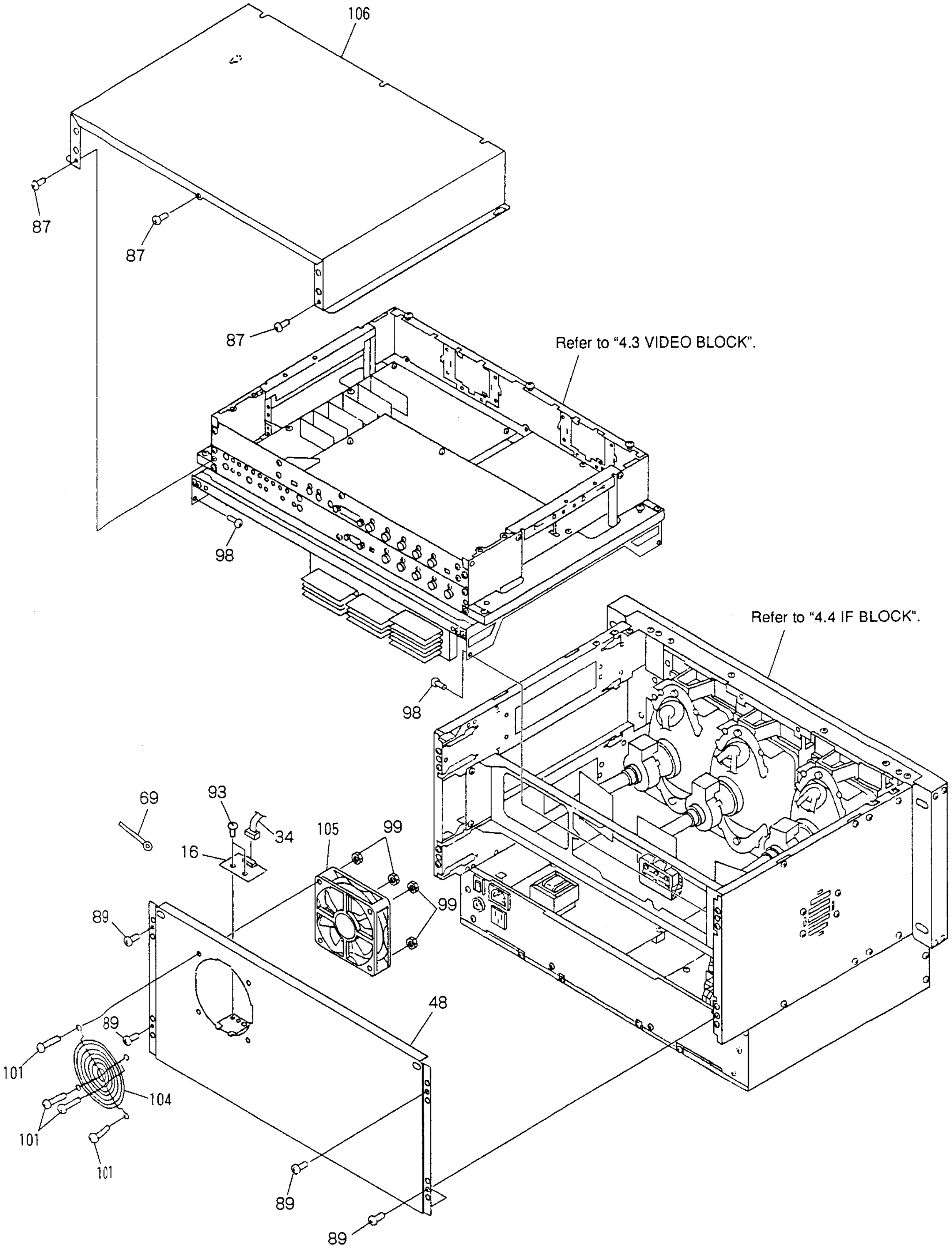
4.2 EXTERIOR BLOCK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Refer to "4.3 VIDEO BLOCK".
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Refer to "4.4 IF BLOCK".
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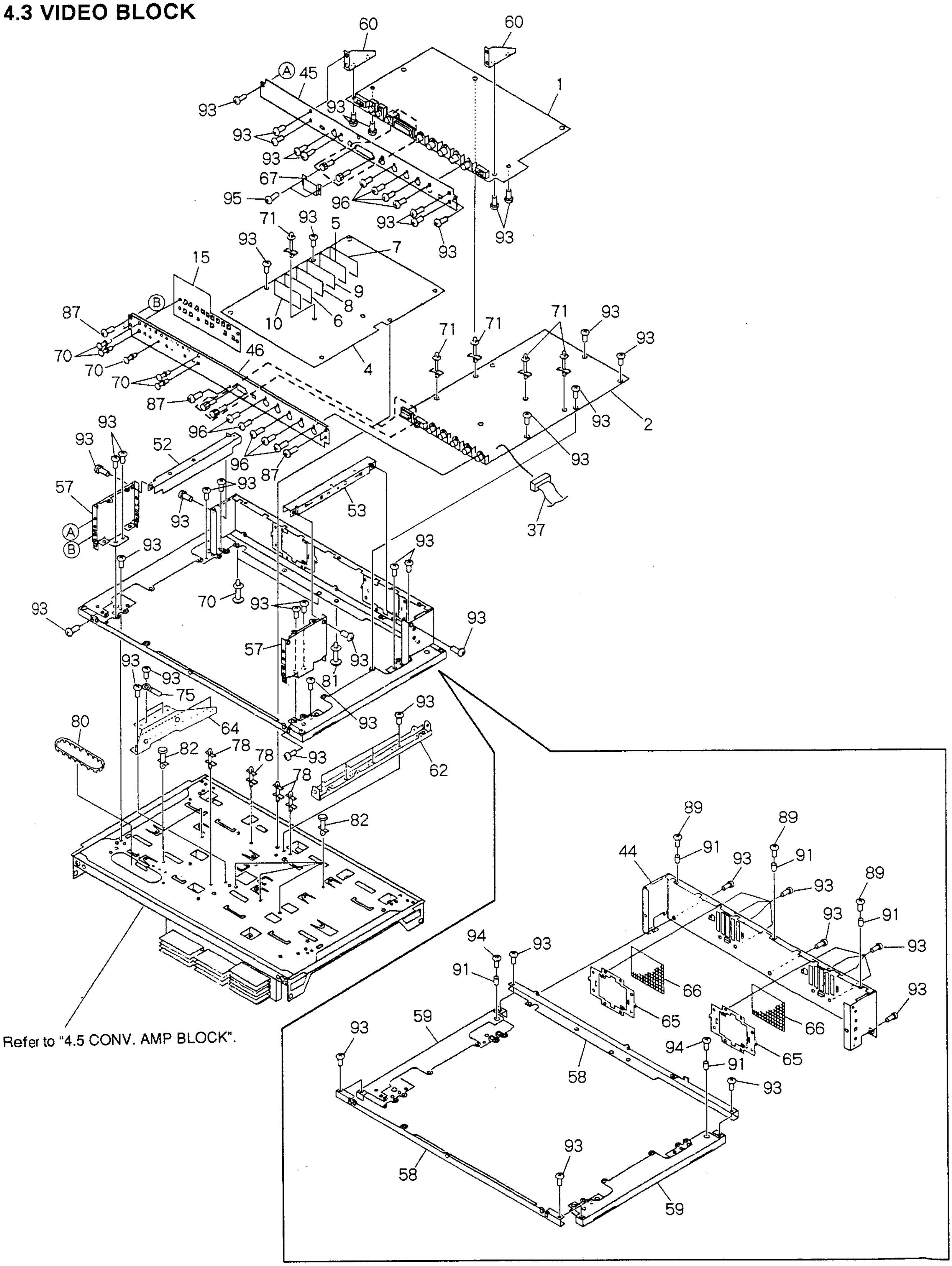
4.3 VIDEO BLOCK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Refer to "4.5 CONV. AMP BLOCK".

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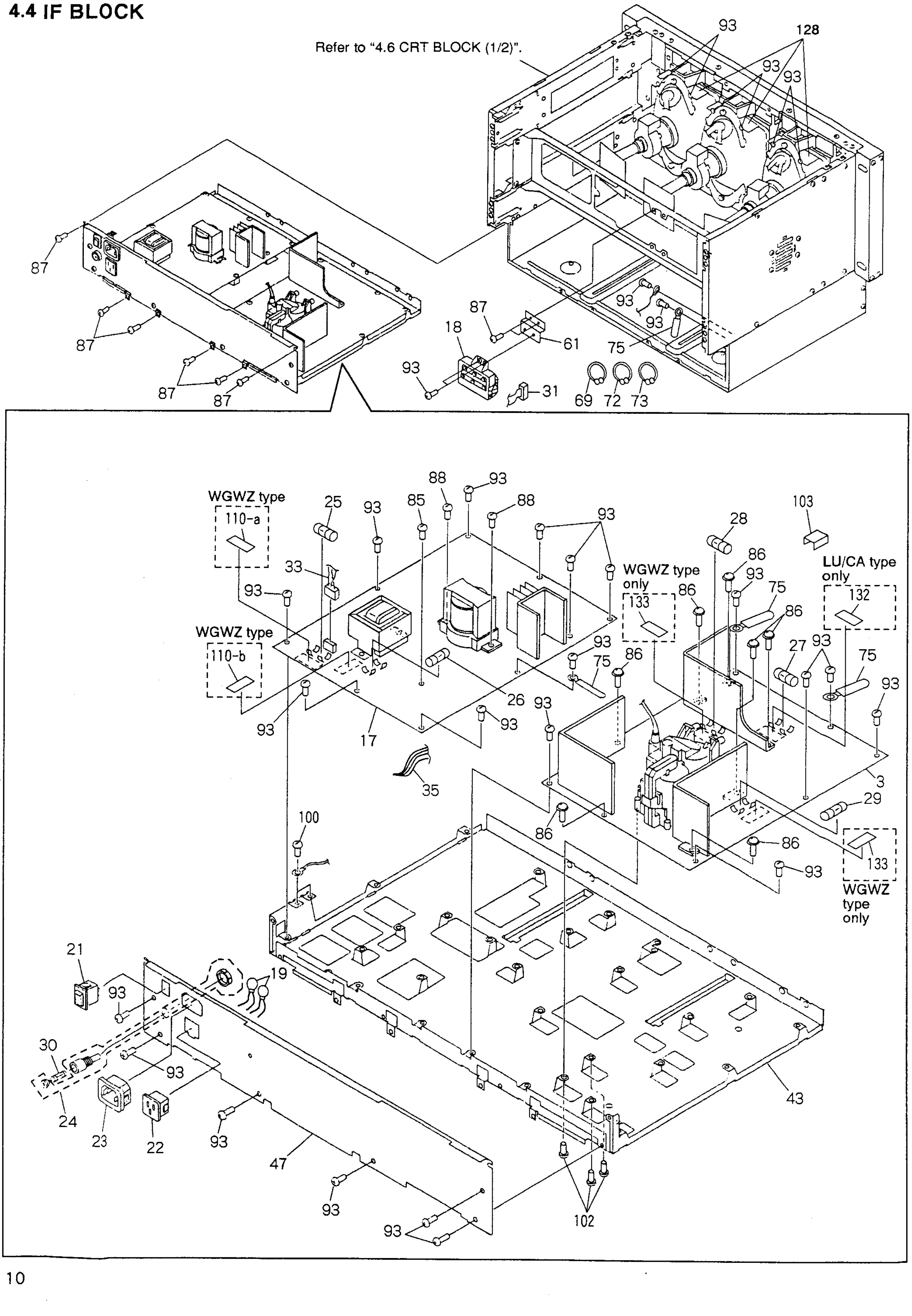
4.4 IF BLOCK



Refer to "4.6 CRT BLOCK (1/2)".
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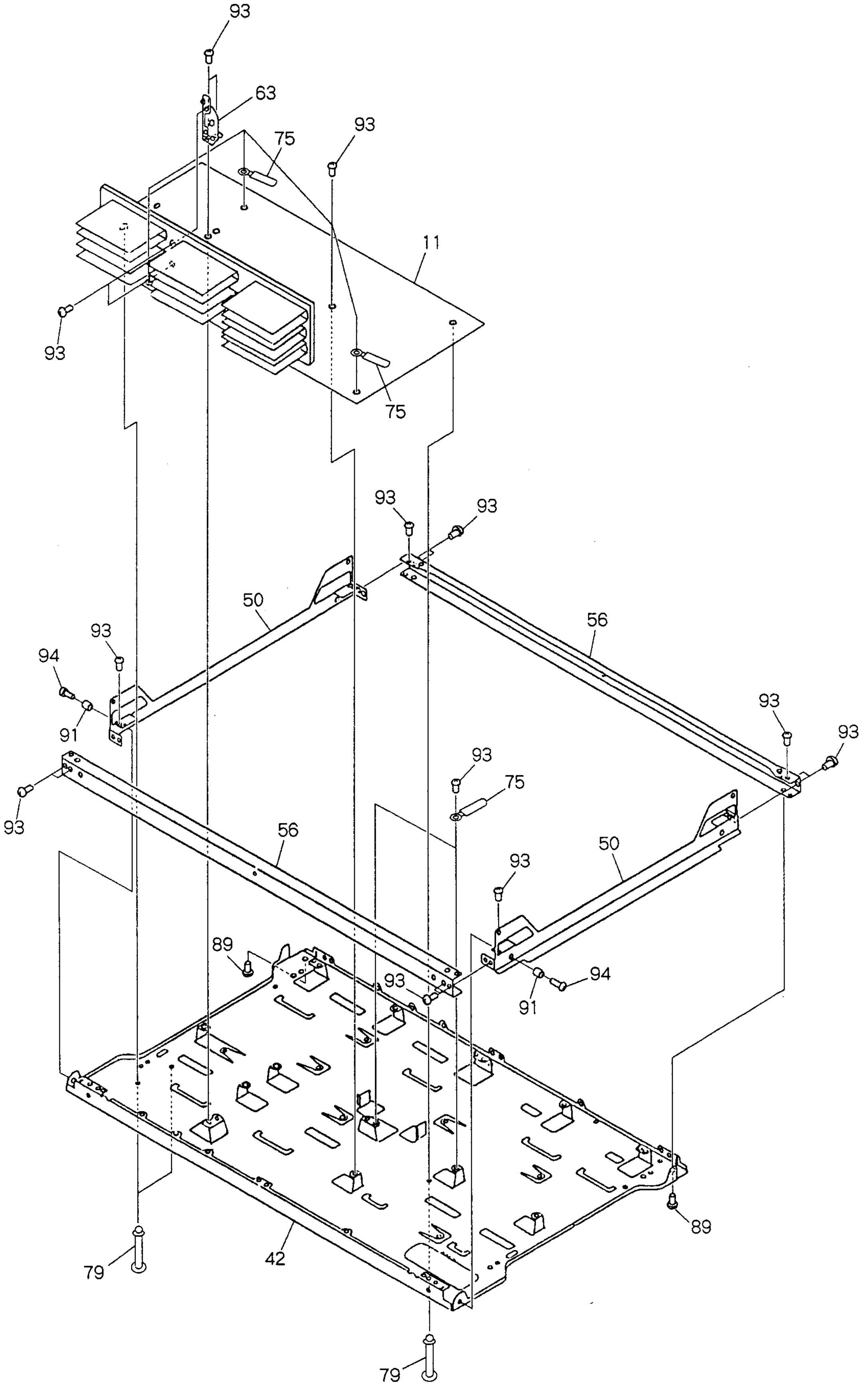
4.5 CONV. AMP. BLOCK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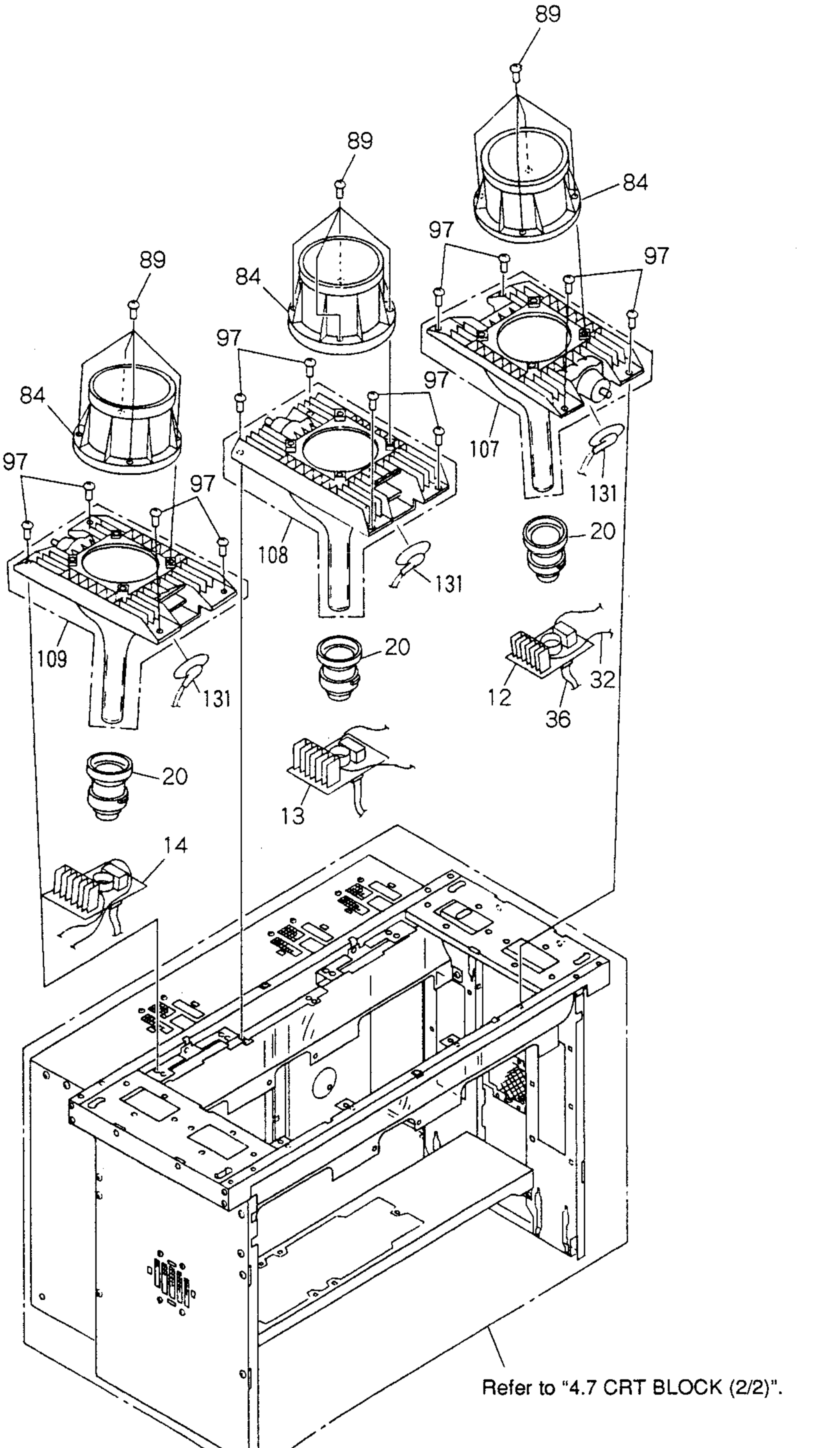
4.6 CRT BLOCK (1/2)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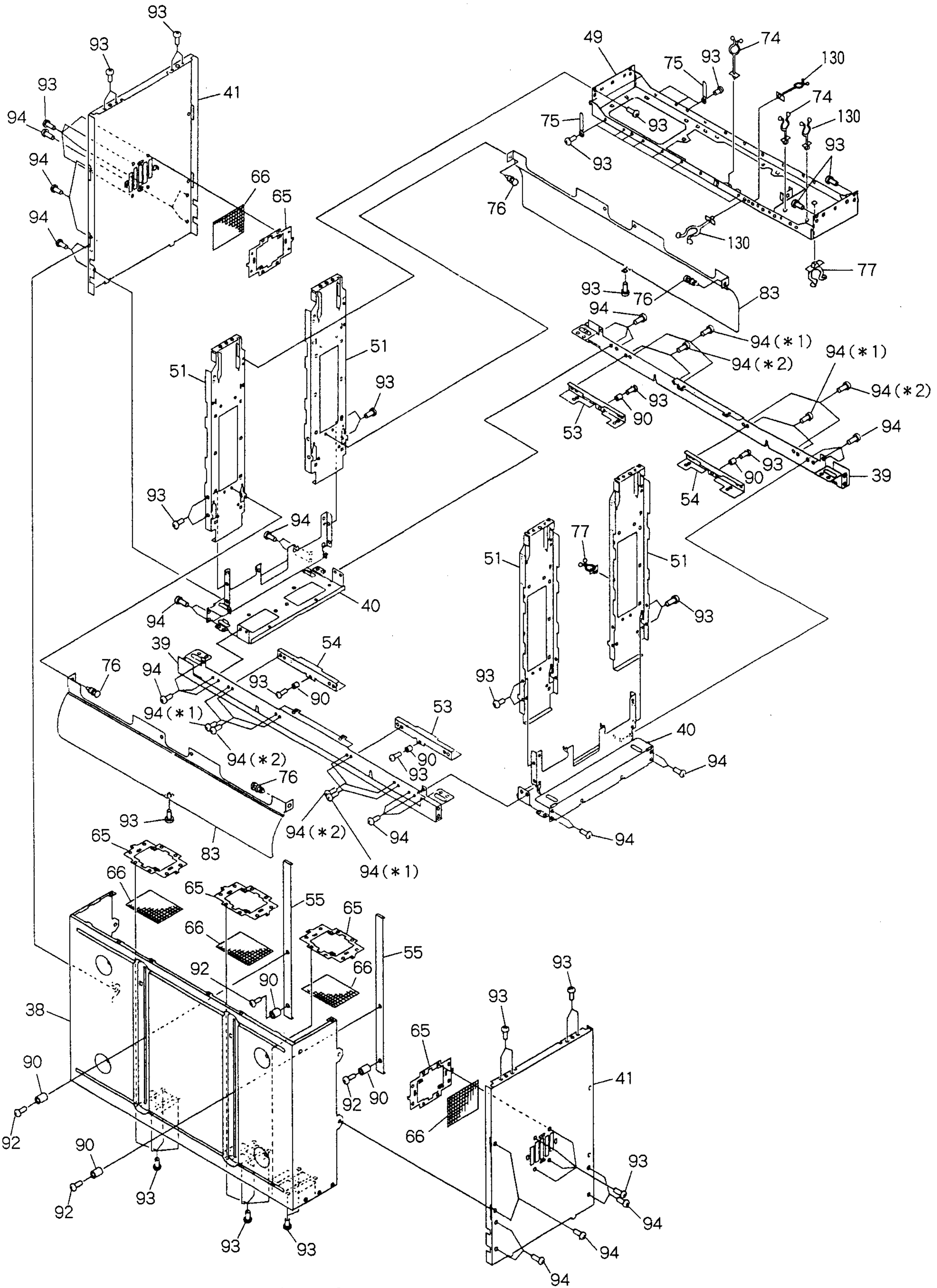
Refer to "4.7 CRT BLOCK (2/2)".

4.7 CRT BLOCK (2/2)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76
94
94(∗1)
94(∗2)
94(∗1)
94(∗2)
51
51
93
93
90
53
93
90
54
94
39
93
94
94
40
77
51
51
93
39
54
76
94
93
90
94(∗1)
53
94(∗2)
90
93
76
40
94
93
94
83
94(∗2)
94
65
94(∗1)
66
65
55
65
66
55
66
92
90
93
93
38
65
90
92
90
41
92
66
90
93
92
93
93
94
93
93
94
94

Note;
(∗1) : RM-V2400NA/LU/CA and RM-V2400NE/WGWZ
(∗2) : RM-V2500NA/LU/CA and RM-V2500NE/WGWZ

5. SCHEMATIC AND PCB CONNECTION DIAGRAMS

NOTE FOR SCHEMATIC DIAGRAMS

(Type 5A)

1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:
Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
Tolerance:(F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.

4. CAPACITORS:
Unit : p:pF or μF unless otherwise noted.
Ratings : capacitor (μF) / voltage (V) unless otherwise noted.
Rated voltage : 50V except for electrolytic capacitors.

5. COILS:
Unit : m:mH or μH unless otherwise noted.

6. VOLTAGE AND CURRENT:
▭ or ← V:
DC voltage (V) at no input signal unless otherwise noted.
Value in (   ) is DC voltage at color bar signal input state.
⇐mA or ← mA :
DC current at no input signal unless otherwise noted.

7. OTHERS:
- ⊘ or ⊘ : Adjusting point.
- ◀ : Measurement point.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by ☆ are important parts which relate to X-rays radiation. If any of these parts needs to be replaced, always replace with specified parts.
- Parts marked by × are important parts which relate to X-rays radiation. If a failure occurs in any of these parts, replace the printed circuit board assembly where the relevant part has already been adjusted as a working component. Do not replace the actual part itself. If any part marked by × is replaced, there is danger of being exposed to X-rays.

8. SCH – ☐ ON THE SCHEMATIC DIAGRAM:
- SCH– ☐ indicates the drawing number of the schematic diagram.
(SCH stands for schematic diagram.)

9. SWITCHES (Underline indicates switch position) :
CONTROL ASSY
S1000 : ABL
S1701 : 75Ω

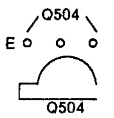
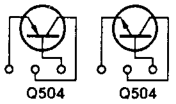
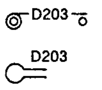
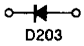
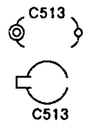
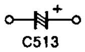
VIDEO ASSY
S2001 : RGB INPUT CHANGEOVER

REAR LED ASSY
S4901 : MULTI
S4902 : POWER
S4903 : COMBI
S4904 : INPUT
S4905 : C MODE
S4906 : STATUS

OUTSIDE OF PCB ASSY
S1 : MAIN POWER

NOTE FOR PCB DIAGRAMS:

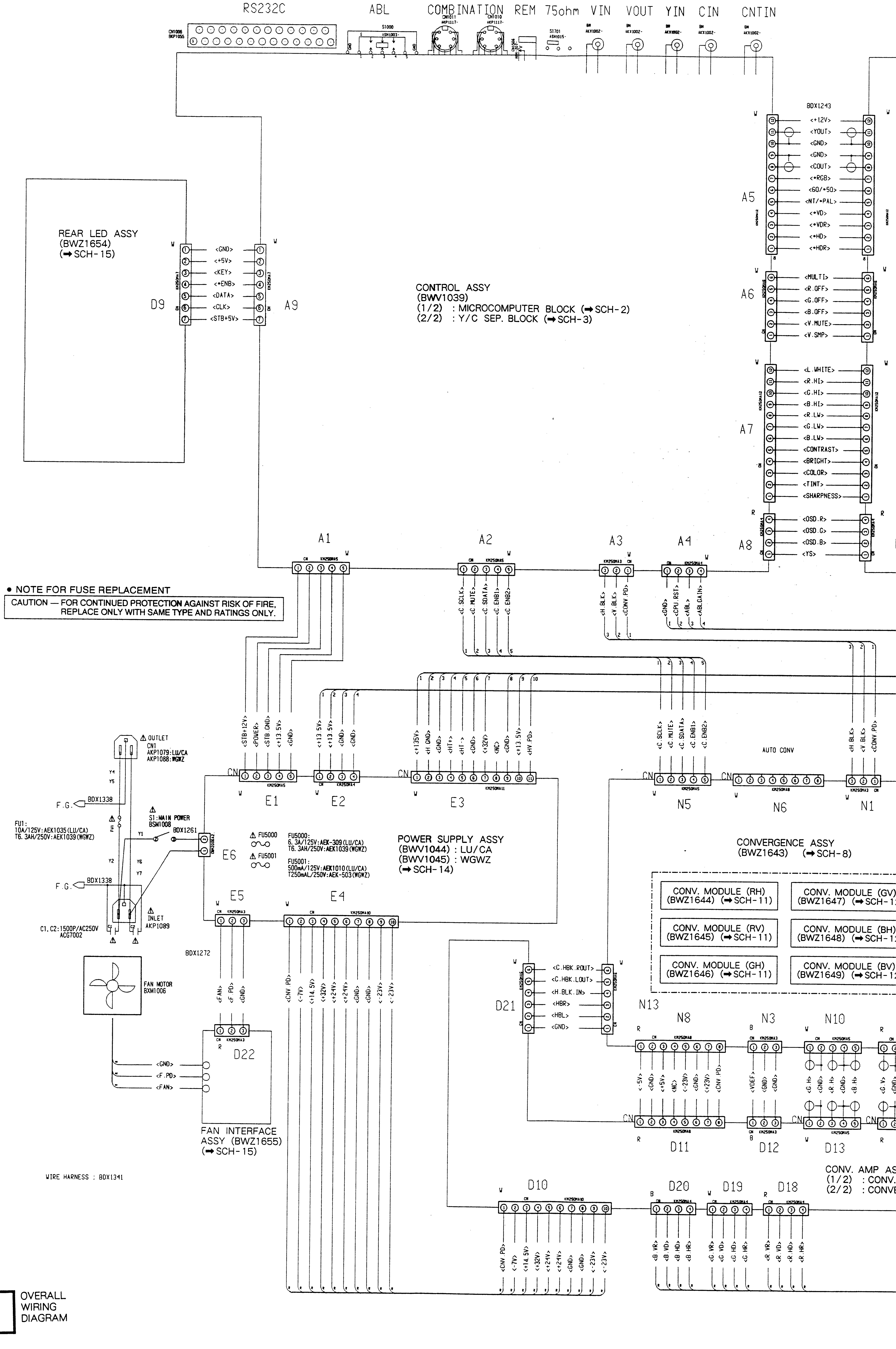
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Diode
		Capacitor (Polarized)

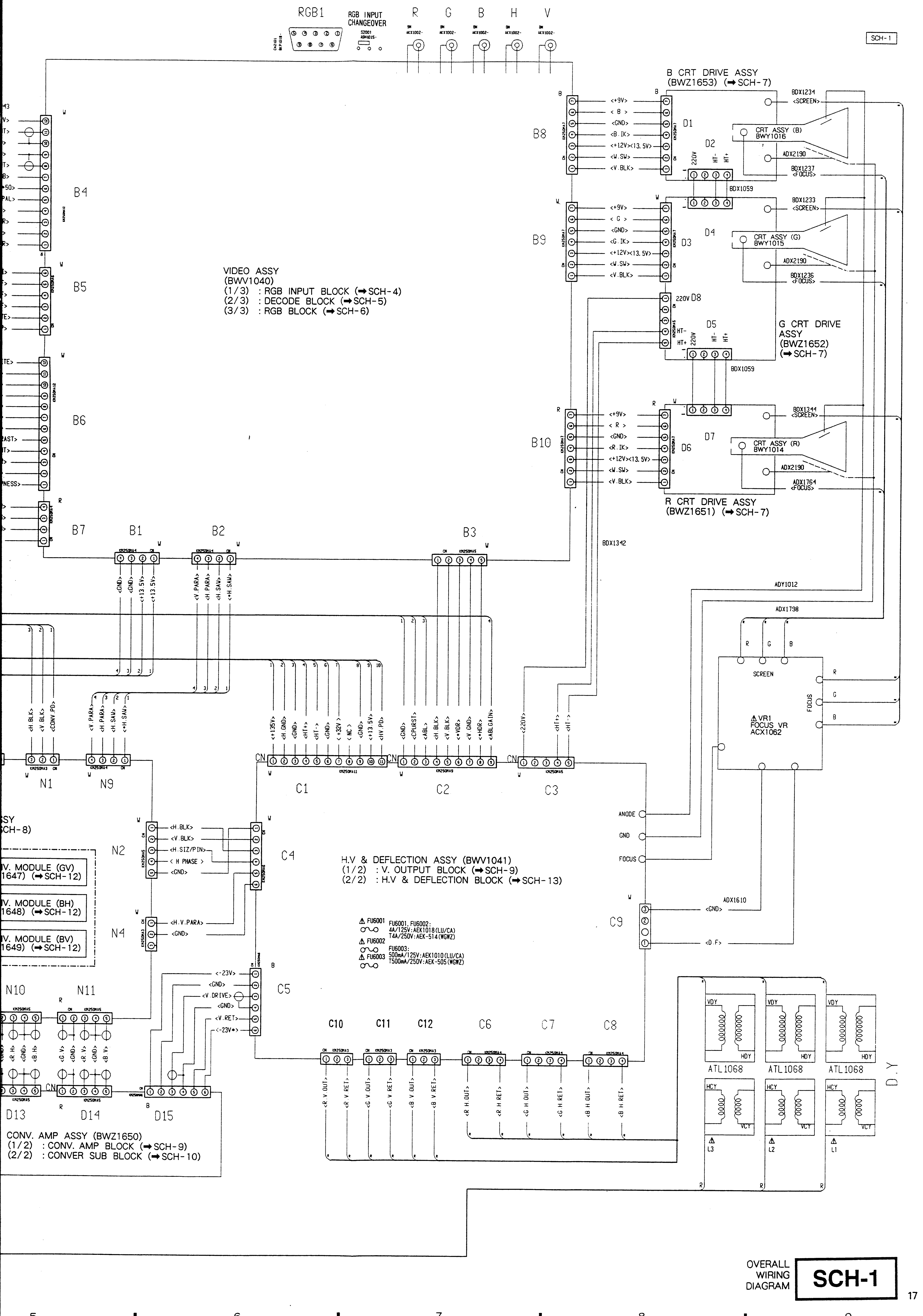
3. The transistor terminal marked with E or ⊏ shows the emitter.
4. The diode terminal marked with ◎ or ⊂ shows cathode side.
5. The capacitor terminal marked with ◎ or ⊏ shows negative terminal.

6. The parts mounted on each PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

5.1 OVERALL WIRING DIAGRAM



RS232C
CN1006 BKP1055
ABL
S1000 ASH1003-
GND
COMBINATION
CN1011 AKP1117-
CN1010 AKP1117-
REM
75ohm
S1701 ASH1015-
VIN
VOUT
YIN
CIN
CNTIN
BN AKX1002-
BDX1243
<+12V>
<YOUT>
<GND>
<COUT>
<+RGB>
<60/+50>
<NT/+PAL>
<+VD>
<+VDR>
<+HD>
<+HDR>
A5
A6
<MULTI>
<R.OFF>
<G.OFF>
<B.OFF>
<V.MUTE>
<V.SMP>
A7
<L.WHITE>
<R.HI>
<G.HI>
<B.HI>
<R.LW>
<G.LW>
<B.LW>
<CONTRAST>
<BRIGHT>
<COLOR>
<TINT>
<SHARPNESS>
A8
<OSD.R>
<OSD.G>
<OSD.B>
<YS>
REAR LED ASSY
(BWZ1654)
(➡SCH-15)
D9
A9
<GND>
<+5V>
<KEY>
<+ENB>
<DATA>
<CLK>
<STB+5V>
CONTROL ASSY
(BWV1039)
(1/2) : MICROCOMPUTER BLOCK (➡SCH-2)
(2/2) : Y/C SEP. BLOCK (➡SCH-3)
A1
A2
A3
A4
KM250MA5
<C.SCLK>
<C.MUTE>
<C.SDATA>
<C.ENB1>
<C.ENB2>
<H.BLK>
<V.BLK>
<CONV.PD>
<GND>
<CPU.RST>
<ABL>
<ABLGAIN>
• NOTE FOR FUSE REPLACEMENT
CAUTION — FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.
⚠ OUTLET
CN1
AKP1079:LU/CA
AKP1088:WGWZ
Y4
Y5
F.G.
BDX1338
FU1:
10A/125V:AEK1035(LU/CA)
T6.3AH/250V:AEK1039(WGWZ)
⚠ S1:MAIN POWER
BSM1008
BDX1261
Y1
Y2
Y6
Y7
⚠ INLET
AKP1089
C1, C2:1500P/AC250V
ACG7002
FAN MOTOR
BXM1006
BDX1272
<STB+12V>
<POWER>
<STB.GND>
<+13.5V>
<GND>
E1
E2
E3
E4
E5
E6
<+135V>
<H.GND>
<HT+>
<HT->
<+32V>
<NC>
<HV.PD>
⚠ FU5000
⚠ FU5001
FU5000:
6.3A/125V:AEK-309(LU/CA)
T6.3AH/250V:AEK1039(WGWZ)
FU5001:
500mA/125V:AEK1010(LU/CA)
T250mAL/250V:AEK-503(WGWZ)
POWER SUPPLY ASSY
(BWV1044) : LU/CA
(BWV1045) : WGWZ
(➡SCH-14)
<FAN>
<F.PD>
<CNV.PD>
<-7V>
<+14.5V>
<+24V>
<-23V>
D22
FAN INTERFACE
ASSY (BWZ1655)
(➡SCH-15)
WIRE HARNESS : BDX1341
N5
N6
N1
AUTO CONV
CONVERGENCE ASSY
(BWZ1643) (➡SCH-8)
CONV. MODULE (RH)
(BWZ1644) (➡SCH-11)
CONV. MODULE (RV)
(BWZ1645) (➡SCH-11)
CONV. MODULE (GH)
(BWZ1646) (➡SCH-11)
CONV. MODULE (GV)
(BWZ1647) (➡SCH-1
CONV. MODULE (BH)
(BWZ1648) (➡SCH-1
CONV. MODULE (BV)
(BWZ1649) (➡SCH-1
D21
<C.HBK.ROUT>
<C.HBK.LOUT>
<H.BLK.IN>
<HBR>
<HBL>
N13
N8
N3
N10
<-5V>
<+5V>
<+23V>
<VDEF>
<G.H>
<R.H>
<B.H>
<G.V>
D11
D12
D13
CONV. AMP AS
(1/2) : CONV.
(2/2) : CONVE
D10
D20
D19
D18
<B.VR>
<B.VD>
<B.HD>
<B.HR>
<G.VR>
<G.VD>
<G.HD>
<G.HR>
<R.VR>
<R.VD>
<R.HD>
<R.HR>


SCH-1
RGB1
RGB INPUT CHANGEOVER
S2001
R
G
B
H
V
VIDEO ASSY
(BWV1040)
(1/3) : RGB INPUT BLOCK (➡SCH-4)
(2/3) : DECODE BLOCK (➡SCH-5)
(3/3) : RGB BLOCK (➡SCH-6)
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
<GND>
<+13.5V>
<V.PARA>
<H.PARA>
<H.SAW>
<+H.SAW>
B CRT DRIVE ASSY
(BWZ1653) (➡SCH-7)
G CRT DRIVE ASSY
(BWZ1652)
(➡SCH-7)
R CRT DRIVE ASSY
(BWZ1651) (➡SCH-7)
D1
D2
D3
D4
D5
D6
D7
D8
<+9V>
< B >
< G >
< R >
<B.IK>
<G.IK>
<R.IK>
<+12V><13.5V>
<W.SW>
<V.BLK>
220V
HT-
HT+
BDX1059
BDX1342
CRT ASSY (B)
BWY1016
CRT ASSY (G)
BWY1015
CRT ASSY (R)
BWY1014
BDX1234
<SCREEN>
BDX1237
<FOCUS>
BDX1233
BDX1236
BDX1344
ADX1764
ADX2190
ADY1012
ADX1798
SCREEN
FOCUS
ΔVR1
FOCUS VR
ACX1062
ANODE
GND
H.V & DEFLECTION ASSY (BWV1041)
(1/2) : V. OUTPUT BLOCK (➡SCH-9)
(2/2) : H.V & DEFLECTION BLOCK (➡SCH-13)
Δ FU6001
Δ FU6002
Δ FU6003
FU6001, FU6002:
4A/125V:AEK1018(LU/CA)
T4A/250V:AEK-514(WGWZ)
FU6003:
500mA/125V:AEK1010(LU/CA)
T500mA/250V:AEK-505(WGWZ)
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
<+135V>
<H.GND>
<HT+>
<HT->
<+32V>
<NC>
<HV.PD>
<CPURST>
<ABL>
<H.BLK>
<+VDR>
<V.GND>
<+HDR>
<ABLGAIN>
<220V>
ADX1610
<D.F>
<-23V>
<V.DRIVE>
<V.RET>
<-23V*>
<R.V.OUT>
<R.V.RET>
<G.V.OUT>
<G.V.RET>
<B.V.OUT>
<B.V.RET>
<R.H.OUT>
<R.H.RET>
<G.H.OUT>
<G.H.RET>
<B.H.OUT>
<B.H.RET>
N1
N2
N4
N9
N10
N11
<H.BLK>
<V.BLK>
<CONV.PD>
<H.SIZ/PIN>
< H PHASE >
<H.V.PARA>
V. MODULE (GV)
1647) (➡SCH-12)
V. MODULE (BH)
1648) (➡SCH-12)
V. MODULE (BV)
1649) (➡SCH-12)
D13
D14
D15
<R.H>
<B.H>
<G.V>
<R.V>
<B.V>
CONV. AMP ASSY (BWZ1650)
(1/2) : CONV. AMP BLOCK (➡SCH-9)
(2/2) : CONVER SUB BLOCK (➡SCH-10)
VDY
HDY
HCY
VCY
ATL1068
L1
L2
L3
D.Y
A
B
C
D
E
F
5
6
7
8
9

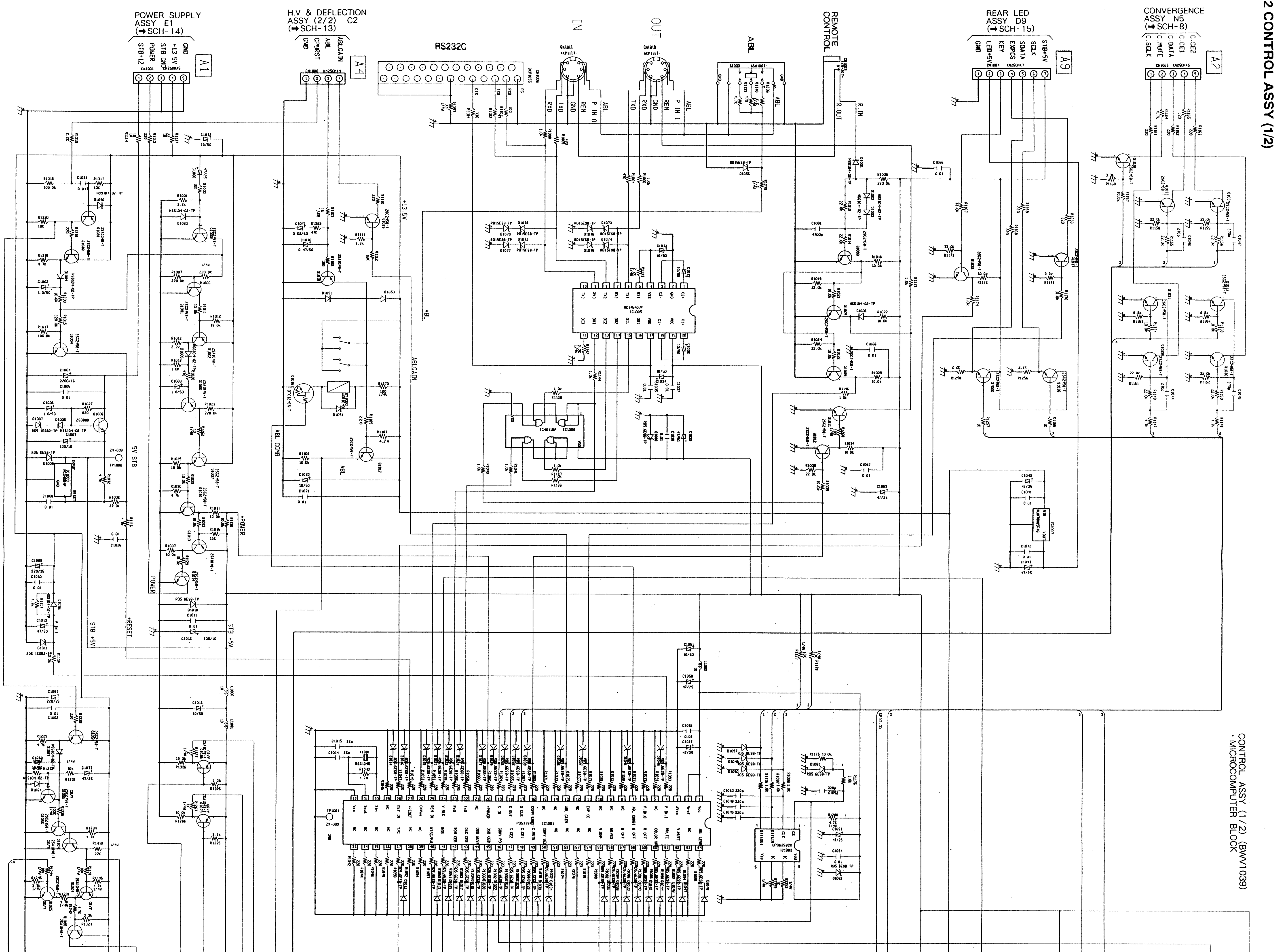
OVERALL WIRING DIAGRAM

SCH-1

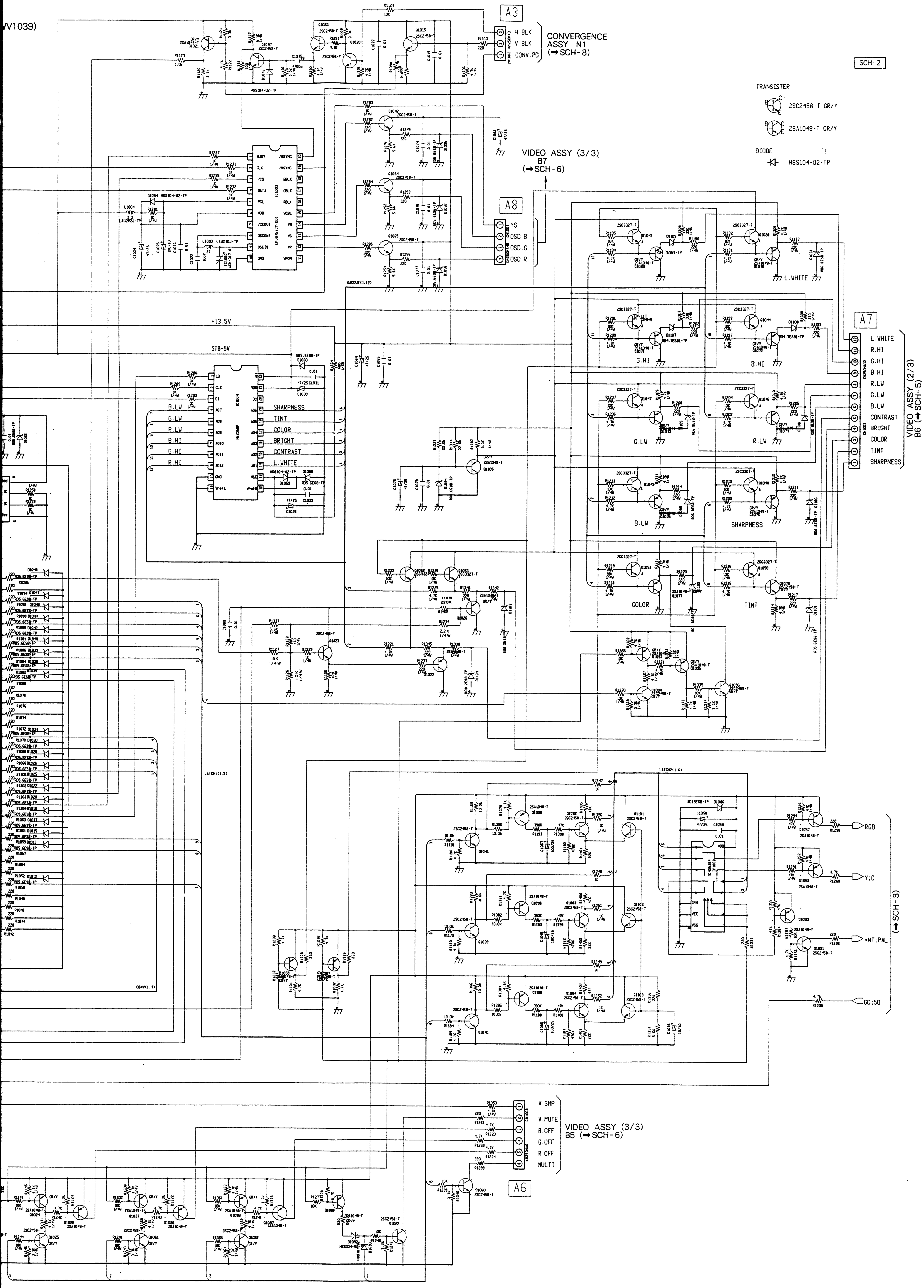
SCH-2

CONTROL ASSY (1/2)

5.2 CONTROL ASSY (1/2)


POWER SUPPLY ASSY E1 (➡SCH-14)
A1
GND
+13.5V
STB GND
POWER
STB+12
H.V & DEFLECTION ASSY (2/2) C2 (➡SCH-13)
A4
ABLGAIN
ABL
CPURST
GND
RS232C
IN
OUT
ABL
REMOTE CONTROL
R.OUT
R.IN
REAR LED ASSY D9 (➡SCH-15)
A9
STB+5V
SCLK
SDATA
EXPCS
KEY
LED+5V
GND
CONVERGENCE ASSY N5 (➡SCH-8)
A2
C.CE2
C.CE1
C.DATA
C.MUTE
C.SCLK
TXD
RXD
GND
REM
P IN O
P IN I
+13.5V
ABL
ABLGAIN
ABL COMB
5V STB
POWER
RESET
STB +5V
+POWER
MC14540 7P IC1005
TC4011BP IC1006
PD5378A IC1001
UPD6252CX IC1002
IC1003
TP1000
TP1001
X1001
1
2
3
4
5

CONTROL ASSY (1/2) (BWV1039)
• MICROCOMPUTER BLOCK

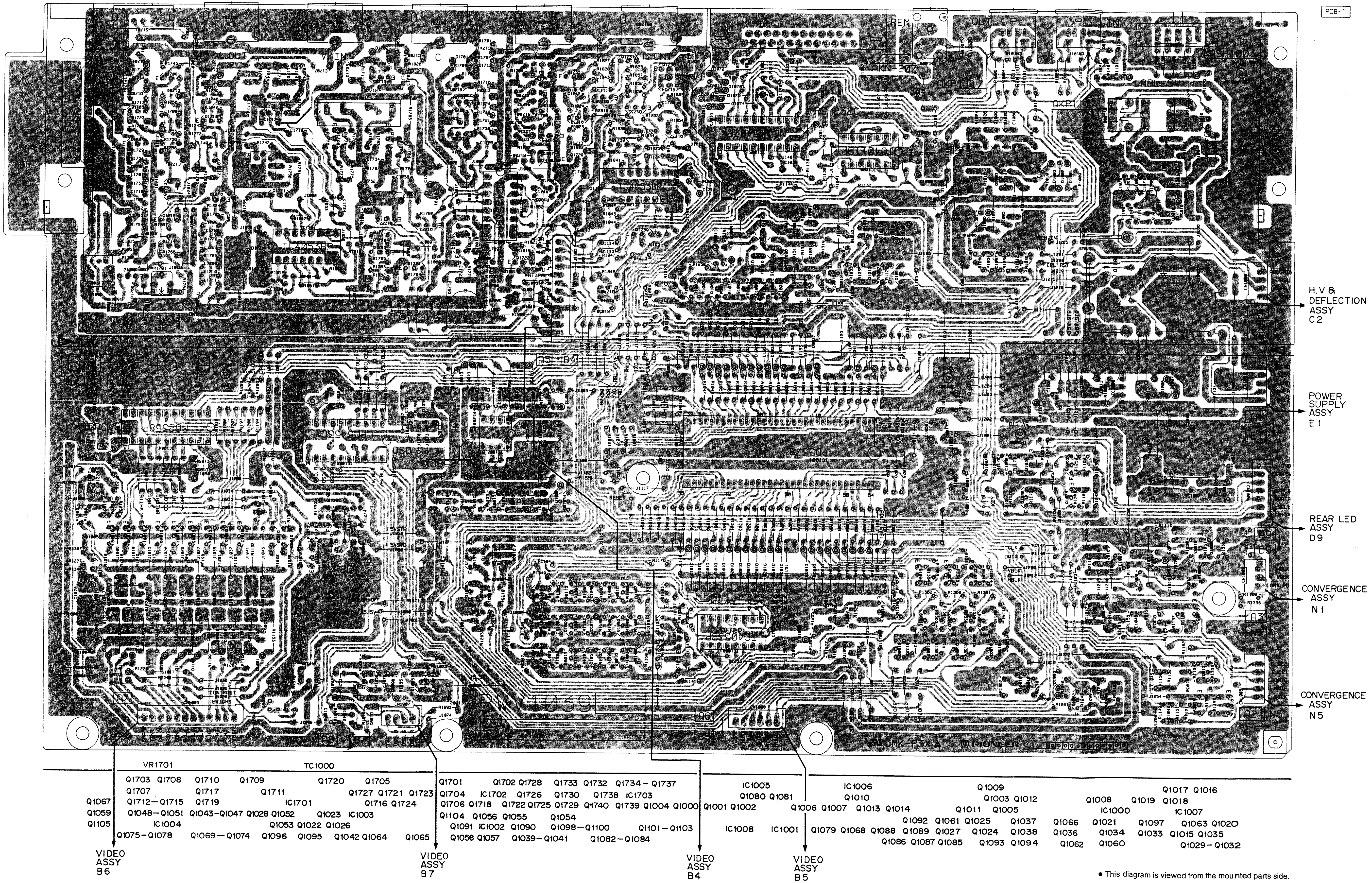

V1039)
A3
H BLK
V BLK
CONV.PD
CONVERGENCE ASSY N1 (➡SCH-8)
SCH-2
TRANSISTER
2SC2458-T GR/Y
2SA1048-T GR/Y
DIODE
HSS104-02-TP
VIDEO ASSY (3/3) B7 (➡SCH-6)
A8
YS
OSD.B
OSD.G
OSD.R
IC1003
UPD6453CY-001
DACOUT(1:12)
+13.5V
STB+5V
IC1004
M62358P
SHARPNESS
TINT
COLOR
BRIGHT
CONTRAST
L.WHITE
B.LW
G.LW
R.LW
B.HI
G.HI
R.HI
A7
L.WHITE
R.HI
G.HI
B.HI
R.LW
G.LW
B.LW
CONTRAST
BRIGHT
COLOR
TINT
SHARPNESS
VIDEO ASSY (2/3) B6 (➡SCH-5)
G.HI
B.HI
G.LW
R.LW
B.LW
SHARPNESS
COLOR
TINT
LATCH1(1:5)
LATCH2(1:6)
CONV(1:4)
IC1008
TC4053BP
RGB
Y:C
NT;PAL
60;50
(➡SCH-3)
V.SMP
V.MUTE
B.OFF
G.OFF
R.OFF
MULTI
VIDEO ASSY (3/3) B5 (➡SCH-6)
A6
5
6
7
8
9

CONTROL
ASSY (1/2)

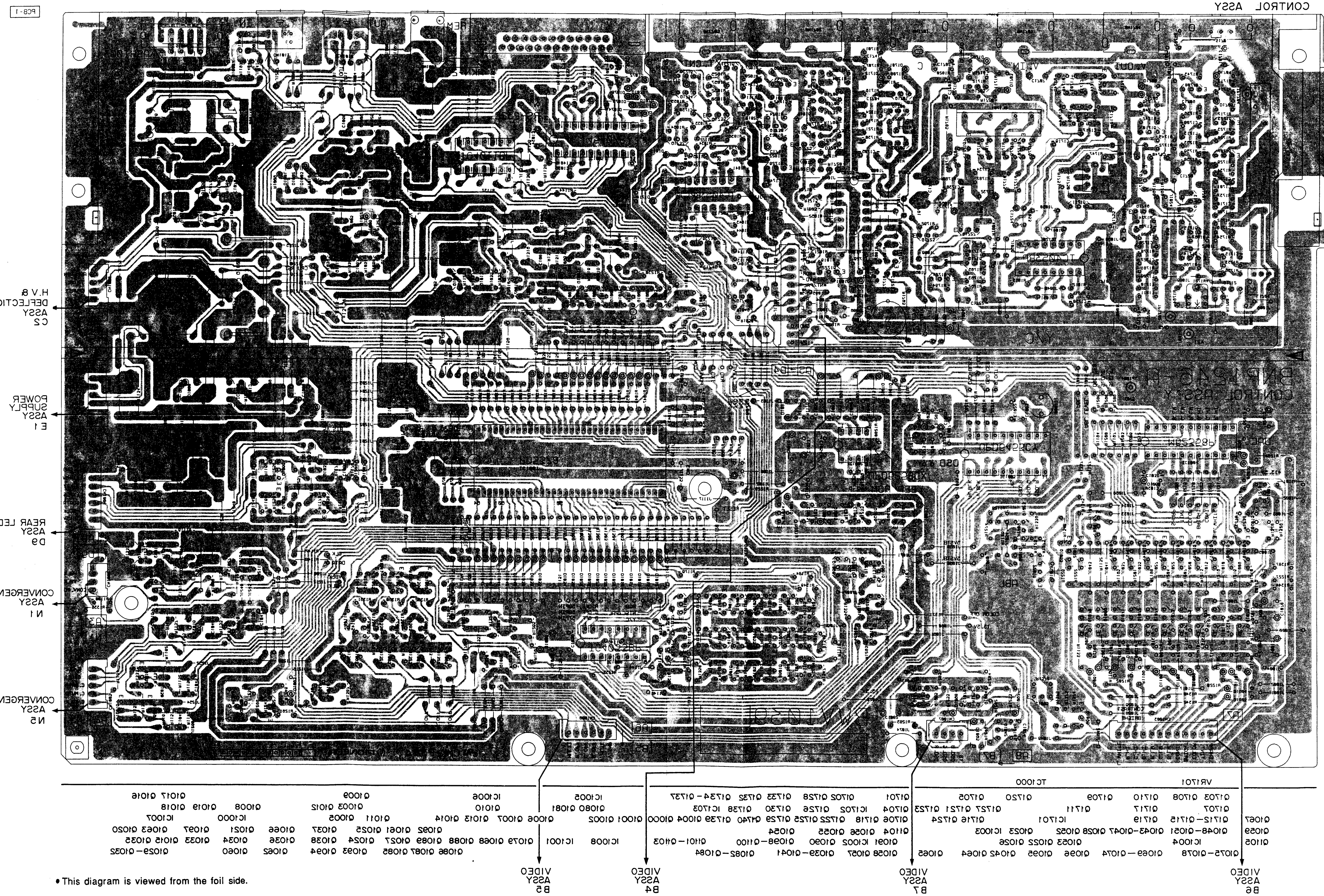
SCH-2

CONTROL ASSY

PCB-1

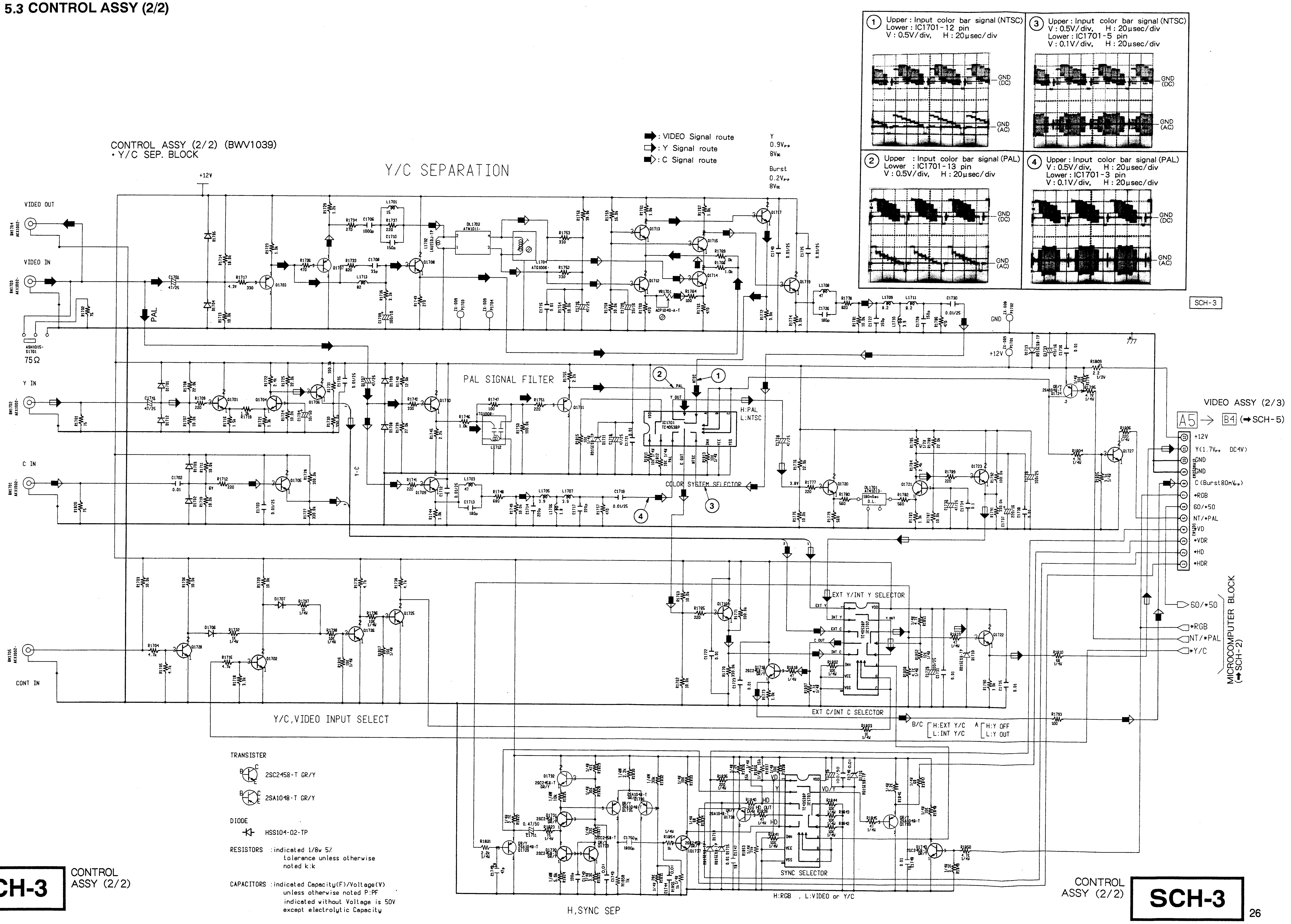

CMK-P3X
PIONEER
REM
OUT
IN
AKN-207
AKP1117
H.V & DEFLECTION ASSY C2
POWER SUPPLY ASSY E1
REAR LED ASSY D9
CONVERGENCE ASSY N1
CONVERGENCE ASSY N5
CONTRAST
BRIGHT
RESET
VR1701
TC1000
Q1703 Q1708 Q1710 Q1709 Q1720 Q1705
Q1707 Q1717 Q1711 Q1727 Q1721 Q1723
Q1067 Q1712–Q1715 Q1719 IC1701 Q1716 Q1724
Q1059 Q1048–Q1051 Q1043–Q1047 Q1028 Q1052 Q1023 IC1003
Q1105 IC1004 Q1053 Q1022 Q1026
Q1075–Q1078 Q1069–Q1074 Q1096 Q1095 Q1042 Q1064 Q1065
Q1701 Q1702 Q1728 Q1733 Q1732 Q1734–Q1737
Q1704 IC1702 Q1726 Q1730 Q1738 IC1703
Q1706 Q1718 Q1722 Q1725 Q1729 Q1740 Q1739 Q1004 Q1000
Q1104 Q1056 Q1055 Q1054
Q1091 IC1002 Q1090 Q1098–Q1100 Q1101–Q1103
Q1058 Q1057 Q1039–Q1041 Q1082–Q1084
IC1005
Q1080 Q1081
Q1001 Q1002
IC1008 IC1001
IC1006
Q1010
Q1006 Q1007 Q1013 Q1014
Q1079 Q1068 Q1088
Q1009
Q1003 Q1012
Q1011 Q1005
Q1092 Q1061 Q1025 Q1037
Q1089 Q1027 Q1024 Q1038
Q1086 Q1087 Q1085 Q1093 Q1094
Q1066 Q1036 Q1062
Q1008 IC1000 Q1021 Q1034 Q1060
Q1019 Q1097 Q1033
Q1017 Q1016
Q1018
IC1007
Q1063 Q1020
Q1015 Q1035
Q1029–Q1032
VIDEO ASSY B6
VIDEO ASSY B7
VIDEO ASSY B4
VIDEO ASSY B5

- This diagram is viewed from the mounted parts side.


PCB-1
CONTROL ASSY
H.V & DEFLECTION ASSY C2
POWER SUPPLY ASSY E1
REAR LED ASSY D9
CONVERGENCE ASSY N1
CONVERGENCE ASSY N5
VIDEO ASSY B5
VIDEO ASSY B4
VIDEO ASSY B7
VIDEO ASSY B6
TC1000
VR1701
Q1017 Q1016
Q1008 Q1019 Q1018
IC1007 IC1000
Q1066 Q1021 Q1097 Q1063 Q1020
Q1036 Q1034 Q1033 Q1015 Q1035
Q1062 Q1060 Q1029—Q1032
Q1009
Q1003 Q1012
Q1011 Q1005
Q1092 Q1061 Q1025 Q1037
Q1079 Q1068 Q1088 Q1089 Q1027 Q1024 Q1038
Q1086 Q1087 Q1085 Q1093 Q1094
IC1006
Q1010
Q1006 Q1007 Q1013 Q1014
IC1005
Q1080 Q1081
Q1001 Q1002
IC1001 IC1008
Q1701 Q1702 Q1728 Q1733 Q1732 Q1734—Q1737
Q1704 IC1702 Q1726 Q1730 Q1738 IC1703
Q1706 Q1718 Q1722 Q1725 Q1729 Q1740 Q1739 Q1004 Q1000
Q1104 Q1056 Q1055 Q1054
Q1091 IC1002 Q1090 Q1098—Q1100 Q1101—Q1103
Q1058 Q1057 Q1039—Q1041 Q1082—Q1084
Q1703 Q1708 Q1710 Q1709 Q1720 Q1705
Q1707 Q1717 Q1711 Q1727 Q1721 Q1723
Q1712—Q1715 Q1719 IC1701 Q1716 Q1724
Q1048—Q1051 Q1043—Q1047 Q1028 Q1052 Q1023 IC1003
IC1004 Q1053 Q1022 Q1026
Q1075—Q1078 Q1069—Q1074 Q1096 Q1095 Q1042 Q1064 Q1065
Q1067
Q1059
Q1105

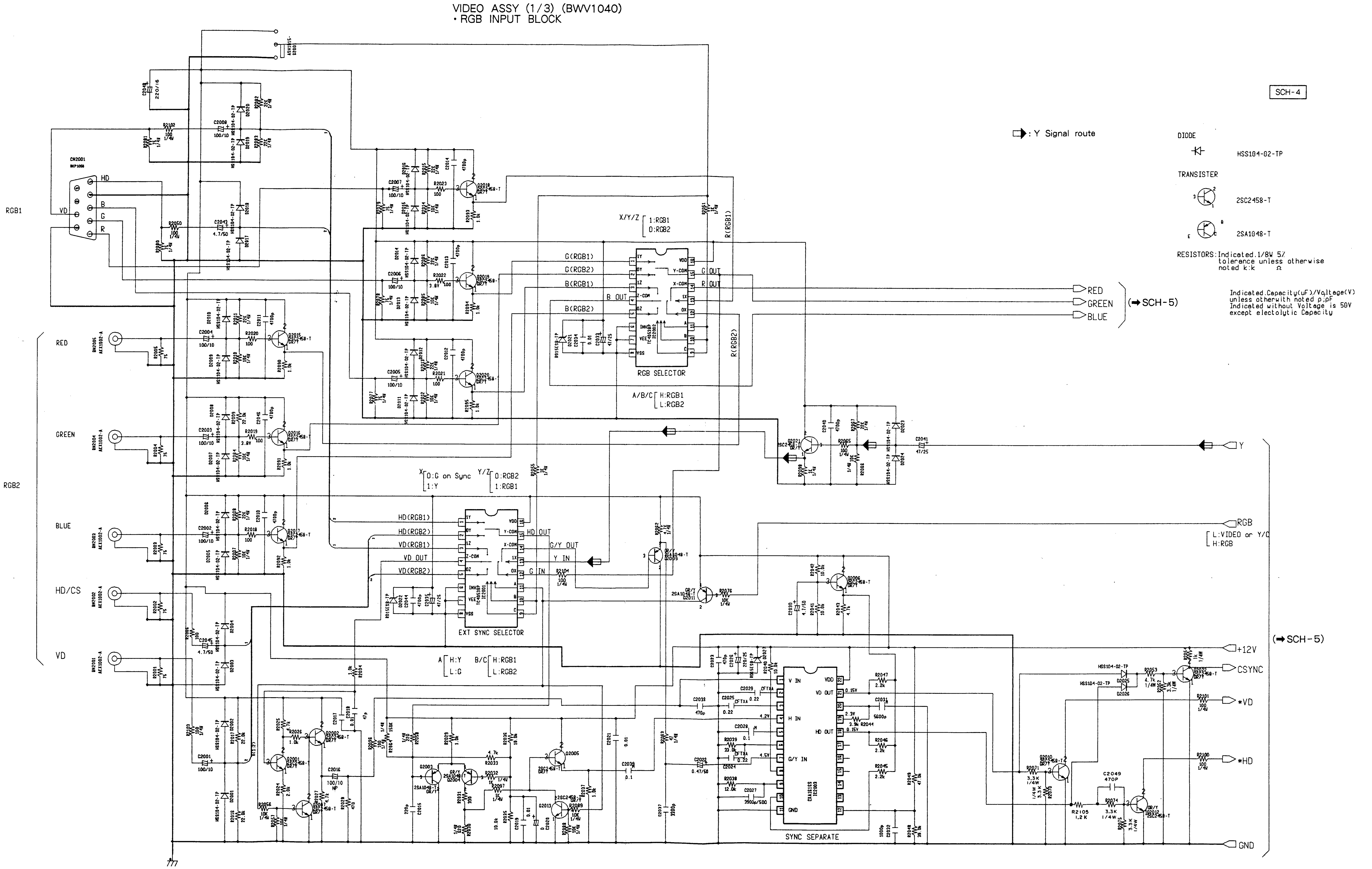
• This diagram is viewed from the foil side.

5.3 CONTROL ASSY (2/2)

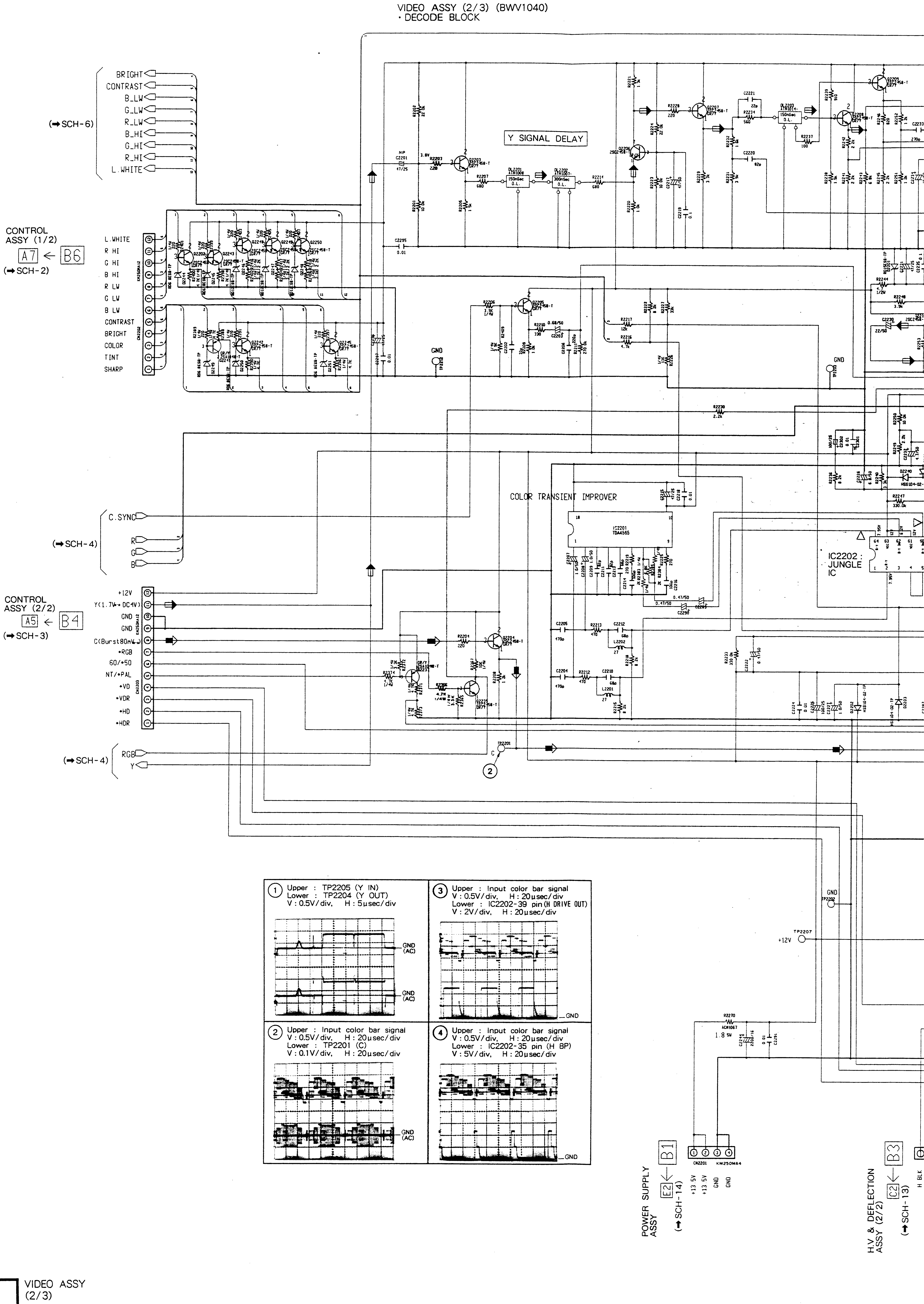


① Upper : Input color bar signal (NTSC) Lower : IC1701-12 pin V : 0.5V/div, H : 20μsec/div
② Upper : Input color bar signal (PAL) Lower : IC1701-13 pin V : 0.5V/div, H : 20μsec/div
③ Upper : Input color bar signal (NTSC) V : 0.5V/div, H : 20μsec/div Lower : IC1701-5 pin V : 0.1V/div, H : 20μsec/div
④ Upper : Input color bar signal (PAL) V : 0.5V/div, H : 20μsec/div Lower : IC1701-3 pin V : 0.1V/div, H : 20μsec/div
GND (DC)
GND (AC)
SCH-3
CONTROL ASSY (2/2) (BWV1039)
• Y/C SEP. BLOCK
Y/C SEPARATION
: VIDEO Signal route
: Y Signal route
: C Signal route
Y 0.9Vp-p 8Vdc
Burst 0.2Vp-p 8Vdc
+12V
VIDEO OUT
VIDEO IN
75Ω
Y IN
C IN
CONT IN
PAL
PAL SIGNAL FILTER
H:PAL L:NTSC
COLOR SYSTEM SELECTOR
IC1701 TC4053BP
GND
VIDEO ASSY (2/3)
A5 → B4 (➡SCH-5)
+12V
Y(1.7Vp-p DC4V)
GND
GND
C(Burst80mVp-p)
•RGB
60/•50
NT/•PAL
VD
•VDR
•HD
•HDR
60/•50
•RGB
NT/•PAL
•Y/C
MICROCOMPUTER BLOCK (⬆SCH-2)
EXT Y/INT Y SELECTOR
EXT C/INT C SELECTOR
B/C H:EXT Y/C L:INT Y/C
A H:Y OFF L:Y OUT
Y/C,VIDEO INPUT SELECT
H,SYNC SEP
SYNC SELECTOR
H:RGB , L:VIDEO or Y/C
Y-C
TRANSISTER
2SC2458-T GR/Y
2SA1048-T GR/Y
DIODE
HSS104-02-TP
RESISTORS :indicated 1/8w 5/ tolerance unless otherwise noted k:k
CAPACITORS :indicated Capacity(F)/Voltage(V) unless otherwise noted P:PF indicated without Voltage is 50V except electrolytic Capacity

5.4 VIDEO ASSY (1/3)

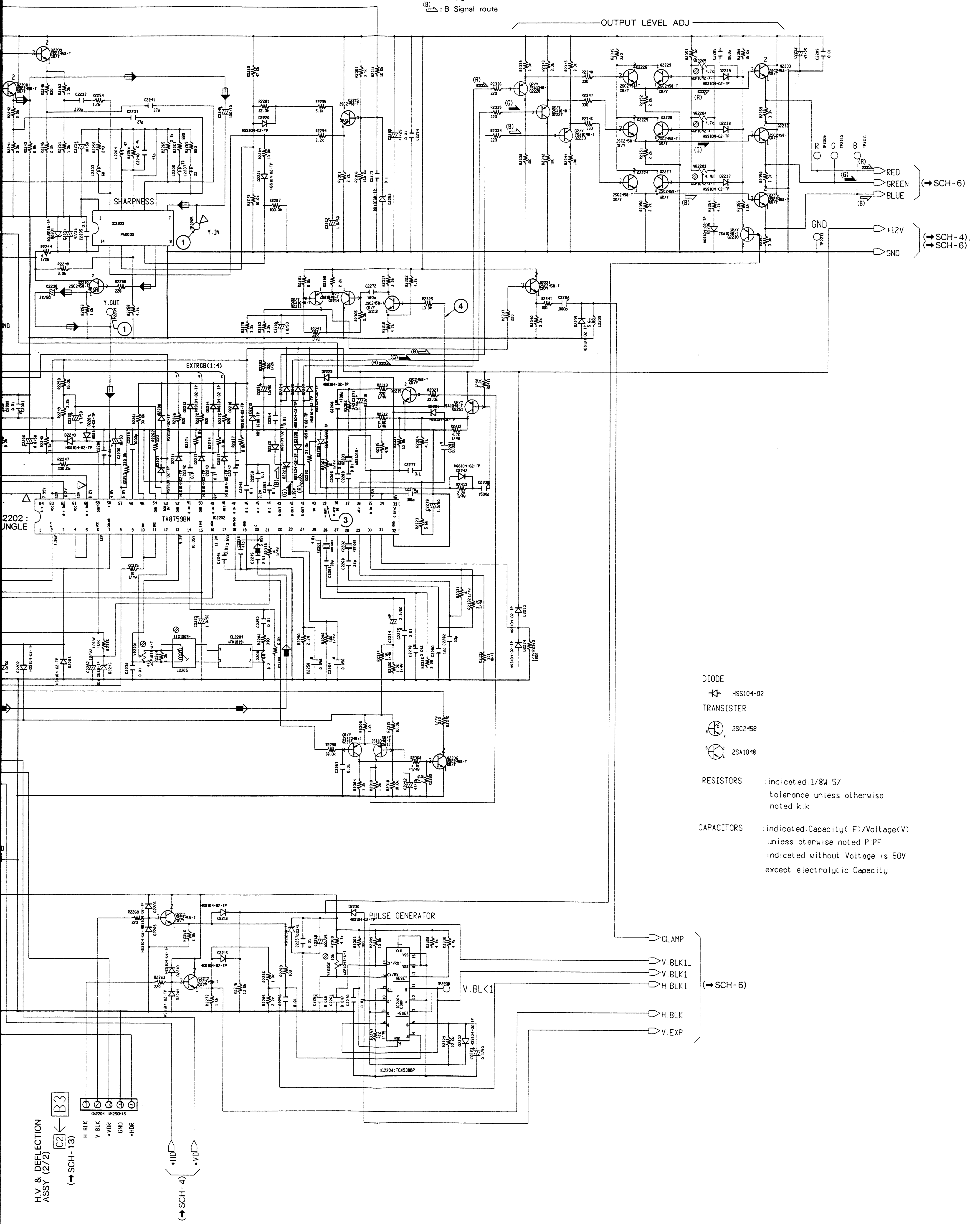

VIDEO ASSY (1/3) (BWV1040)
• RGB INPUT BLOCK
SCH-4
: Y Signal route
DIODE
HSS104-02-TP
TRANSISTER
2SC2458-T
2SA1048-T
RESISTORS: Indicated.1/8W 5% tolerance unless otherwise noted k:k Ω
Indicated.Capacity(uF)/Voltage(V) unless otherwith noted p;pF Indicated without Voltage is 50V except electolytic Capacity
RGB1
CN2001
HD
VD
B
G
R
RGB2
RED
GREEN
BLUE
HD/CS
VD
X/Y/Z 1:RGB1 0:RGB2
G(RGB1)
G(RGB2)
B(RGB1)
B(RGB2)
B OUT
G OUT
R OUT
R(RGB1)
R(RGB2)
RGB SELECTOR
A/B/C H:RGB1 L:RGB2
RED
GREEN
BLUE
(➡SCH-5)
Y
X 0:G on Sync 1:Y
Y/Z 0:RGB2 1:RGB1
HD(RGB1)
HD(RGB2)
VD(RGB1)
VD OUT
VD(RGB2)
HD OUT
G/Y OUT
Y IN
G IN
EXT SYNC SELECTOR
A H:Y L:G
B/C H:RGB1 L:RGB2
RGB
L:VIDEO or Y/C
H:RGB
(➡SCH-5)
+12V
CSYNC
*VD
*HD
GND
V IN
VDD
VD OUT
H IN
HD OUT
G/Y IN
GND
SYNC SEPARATE

5.5 VIDEO ASSY (2/3)


VIDEO ASSY (2/3) (BWV1040)
· DECODE BLOCK
(➡SCH-6)
BRIGHT
CONTRAST
B_LW
G_LW
R_LW
B_HI
G_HI
R_HI
L.WHITE
CONTROL ASSY (1/2)
A7 ← B6
(➡SCH-2)
L.WHITE
R HI
G HI
B HI
R LW
G LW
B LW
CONTRAST
BRIGHT
COLOR
TINT
SHARP
Y SIGNAL DELAY
DL2201 150nSec D.L.
DL2202 300nSec D.L.
DL2203 150nSec D.L.
GND
COLOR TRANSIENT IMPROVER
IC2201 TDA4565
IC2202 : JUNGLE IC
(➡SCH-4)
C.SYNC
R
G
B
CONTROL ASSY (2/2)
A5 ← B4
(➡SCH-3)
+12V
Y(1.7V→DC4V)
GND
GND
C(Burst80mV)
•RGB
60/•50
NT/•PAL
•VD
•VDR
•HD
•HDR
(➡SCH-4)
RGB
Y
TP2201
C
②
① Upper : TP2205 (Y IN)
Lower : TP2204 (Y OUT)
V : 0.5V/div, H : 5μsec/div
GND (AC)
GND (AC)
③ Upper : Input color bar signal
V : 0.5V/div, H : 20μsec/div
Lower : IC2202-39 pin (H DRIVE OUT)
V : 2V/div, H : 20μsec/div
GND
② Upper : Input color bar signal
V : 0.5V/div, H : 20μsec/div
Lower : TP2201 (C)
V : 0.1V/div, H : 20μsec/div
GND (AC)
④ Upper : Input color bar signal
V : 0.5V/div, H : 20μsec/div
Lower : IC2202-35 pin (H BP)
V : 5V/div, H : 20μsec/div
GND
GND
TP2202
TP2207
+12V
R2270
1.8 5V
POWER SUPPLY ASSY
E2 ← B1
(⬆SCH-14)
CN2201 KM250MA4
+13.5V
+13.5V
GND
GND
H.V & DEFLECTION ASSY (2/2)
C2 ← B3
(⬆SCH-13)
H BLK

SCH-5 VIDEO ASSY (2/3)

⇨ : Y Signal route
➡ : C Signal route
(R) : R Signal route
(G) : G Signal route
(B) : B Signal route


OUTPUT LEVEL ADJ
SHARPNESS
IC2203
PA0030
Y.IN
Y.OUT
EXTRGB(1:4)
IC2202 : JUNGLE
TA8759BN
RED
GREEN
BLUE
(➡SCH-6)
GND
+12V
(➡SCH-4),
(➡SCH-6)
GND
PULSE GENERATOR
V.BLK1
IC2204:TC4538BP
CLAMP
V.BLK1_
V.BLK1
H.BLK1
H.BLK
V.EXP
(➡SCH-6)
CN2204 KM250NA5
H BLK
V BLK
•VDR
GND
•HDR
H.V & DEFLECTION ASSY (2/2)
C2
B3
(➡SCH-13)
•HD
•VD
(SCH-4)
A
B
C
D
E
F
5
6
7
8
9

DIODE
HSS104-02

TRANSISTER
2SC2458
2SA1048

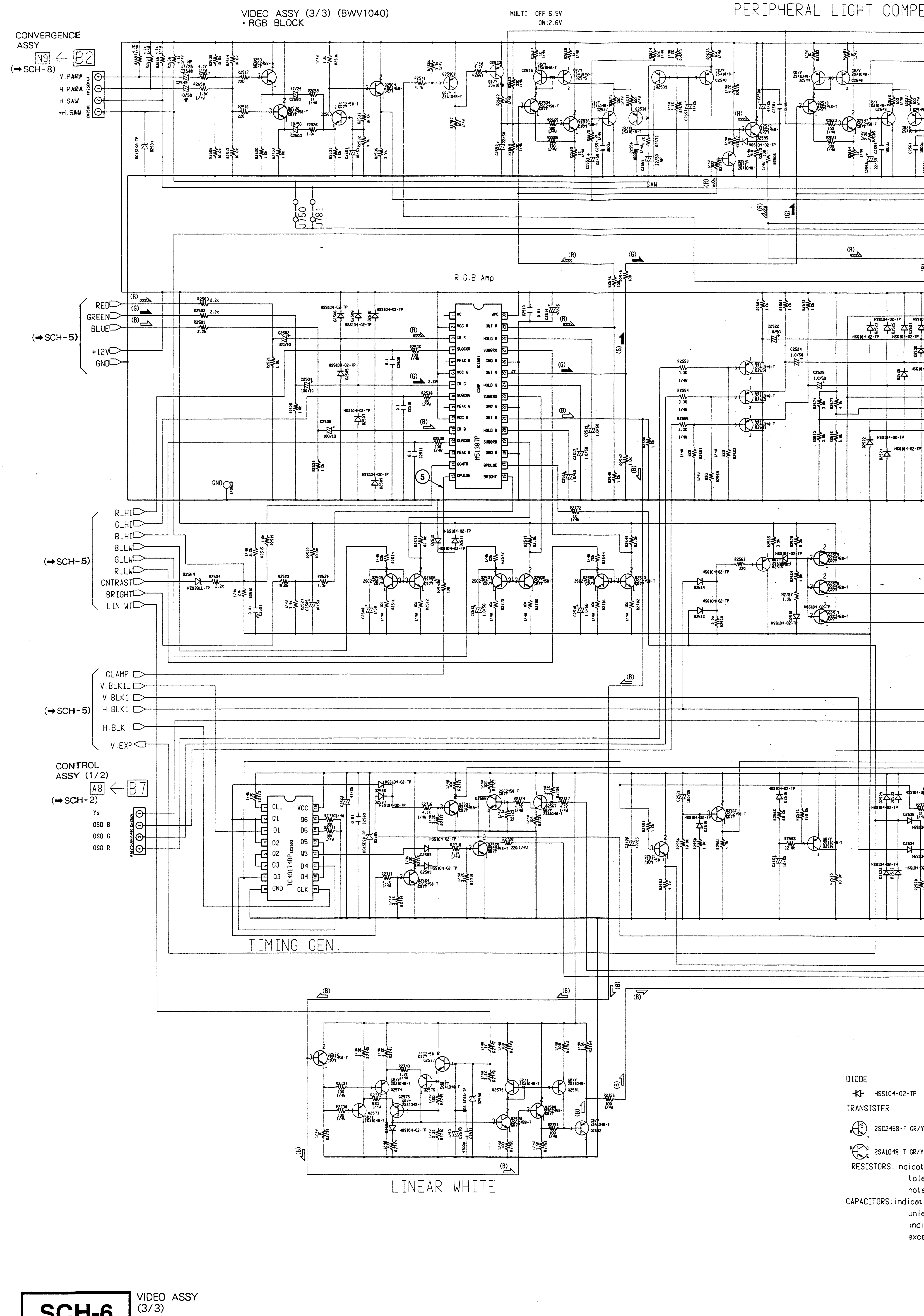
RESISTORS :indicated.1/8W 5%
tolerance unless otherwise
noted k:k

CAPACITORS :indicated.Capacity(F)/Voltage(V)
unless oterwise noted P:PF
indicated without Voltage is 50V
except electrolytic Capacity

VIDEO ASSY
(2/3)

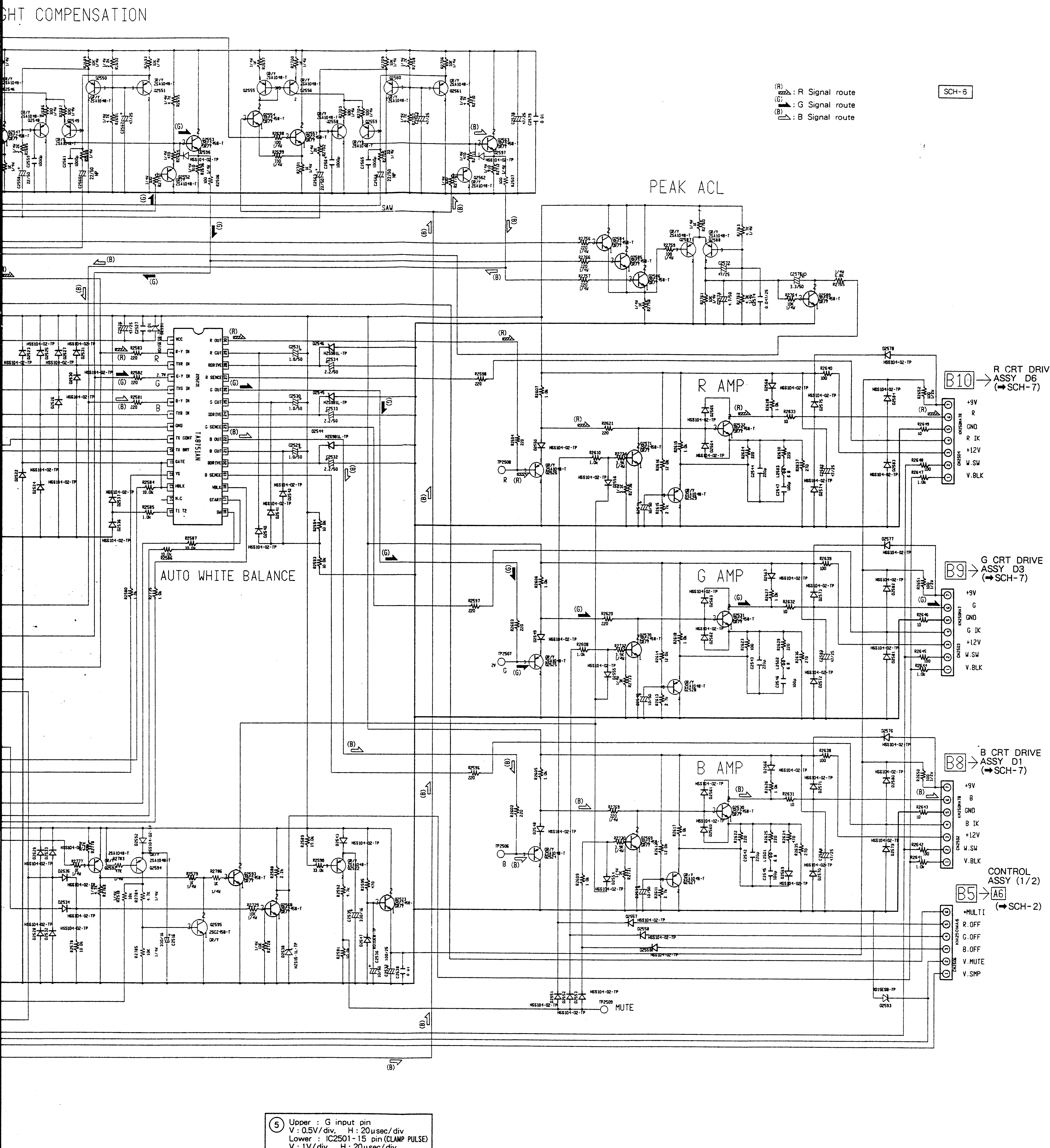
SCH-5

5.6 VIDEO ASSY (3/3)

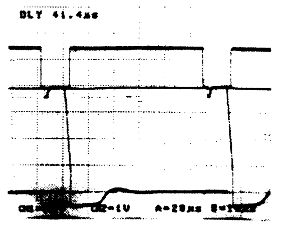

VIDEO ASSY (3/3) (BWV1040)
· RGB BLOCK
MULTI OFF:6.5V
ON:2.6V
PERIPHERAL LIGHT COMPE
CONVERGENCE
ASSY
N9 ← B2
(→SCH-8)
V.PARA
H.PARA
H.SAW
•H.SAW
CN2501
SAW
J750
J781
R.G.B Amp
RED
GREEN
BLUE
(→SCH-5)
+12V
GND
M51387P
IC2501
NC
VCC R
IN R
SUBCOR
PEAK R
VCC G
IN G
SUBCOG
PEAK G
VCC B
IN B
SUBCOB
PEAK B
CONTR
CPULSE
VPC
OUT R
HOLD R
SUBBRR
GND R
OUT G
HOLD G
SUBBRG
GND G
OUT B
HOLD B
SUBBRB
GND B
BPULSE
BRIGHT
5
GND
TP2502
R_HI
G_HI
B_HI
B_LW
G_LW
R_LW
CNTRAST
BRIGHT
LIN.WT
(→SCH-5)
CLAMP
V.BLK1_
V.BLK1
H.BLK1
H.BLK
V.EXP
(→SCH-5)
CONTROL
ASSY (1/2)
A8 ← B7
(→SCH-2)
Ys
OSD B
OSD G
OSD R
CN2505
TC40174BP
IC2503
CL
Q1
D1
D2
Q2
D3
Q3
GND
VCC
Q6
D6
D5
Q5
D4
Q4
CLK
TIMING GEN.
LINEAR WHITE
(R)
(G)
(B)
DIODE
HSS104-02-TP
TRANSISTER
2SC2458-T GR/Y
2SA1048-T GR/Y
RESISTORS: indicat
tole
note
CAPACITORS: indicat
unle
indi
exce
A
B
C
D
E
F
1
2
3
4

(R) ▨ : R Signal route
(G) ◣ : G Signal route
(B) ◺ : B Signal route

SCH-6


GHT COMPENSATION
PEAK ACL
AUTO WHITE BALANCE
IC2501
NV15181A
SAW
R AMP
G AMP
B AMP
B10 → R CRT DRIVE ASSY D6 (➡SCH-7)
+9V
R
GND
R IK
+12V
W.SW
V.BLK
B9 → G CRT DRIVE ASSY D3 (➡SCH-7)
+9V
G
GND
G IK
+12V
W.SW
V.BLK
B8 → B CRT DRIVE ASSY D1 (➡SCH-7)
+9V
B
GND
B IK
+12V
W.SW
V.BLK
B5 → A6 CONTROL ASSY (1/2) (➡SCH-2)
•MULTI
R.OFF
G.OFF
B.OFF
V.MUTE
V.SMP
TP2508
TP2507
TP2506
TP2509 MUTE

⑤ Upper : G input pin
V : 0.5V/div, H : 20µsec/div
Lower : IC2501-15 pin (CLAMP PULSE)
V : 1V/div, H : 20µsec/div



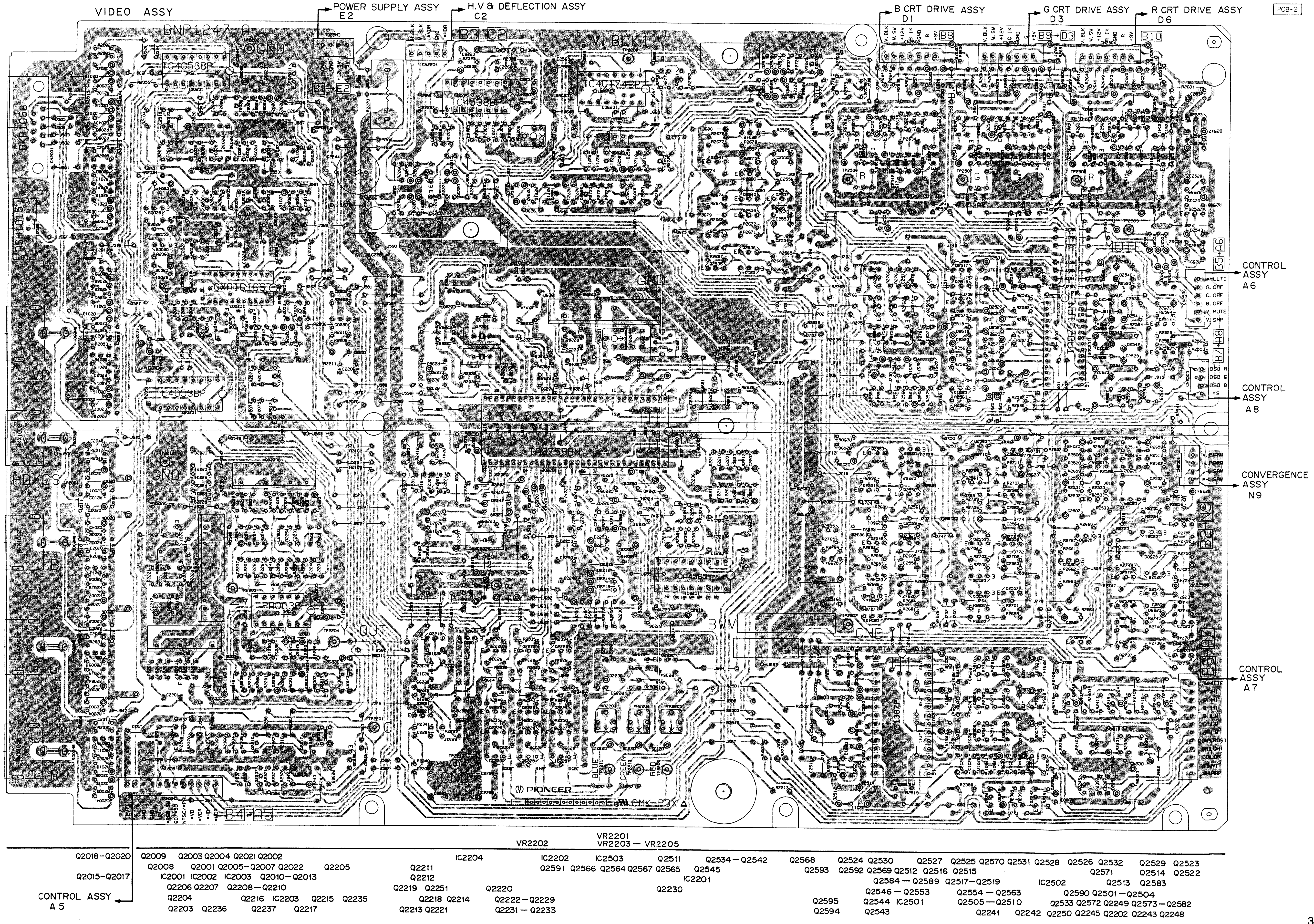
IODE
HSS104-02-TP
TRANSISTER
2SC2458-T GR/Y
2SA1048-T GR/Y
RESISTORS.indicated.1/8W 5%
tolerance unless otherwise
noted k:k
APACITORS.indicated.Capacity(F)/Voltage(V)
unless otherwise noted P:PF
indicated without Voltage is 50V
except electrolytic Capacity

VIDEO ASSY
(3/3)

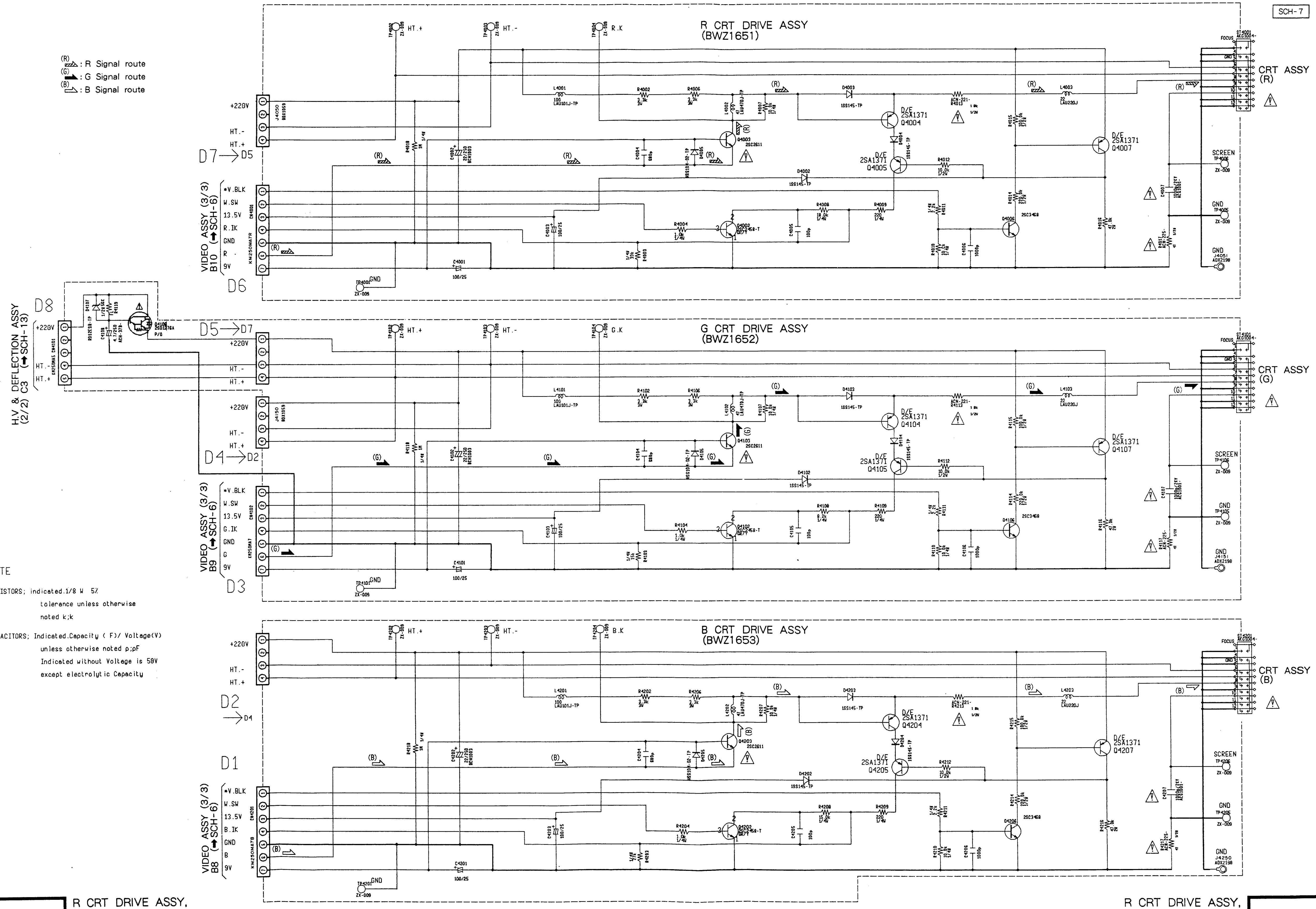
SCH-6

● This diagram is viewed from the mounted parts side.

PCB-2


VIDEO ASSY
BNP1247-A
POWER SUPPLY ASSY
E2
H.V & DEFLECTION ASSY
C2
B CRT DRIVE ASSY
D1
G CRT DRIVE ASSY
D3
R CRT DRIVE ASSY
D6
B3→C2
B1→E2
B8
B9→D3
B10
V BLKI
TC4053BP
TC4538BP
TC4074BP
GXA1165
TA8759BN
TDA4565
PA0030
M51387P
MUTE
BKP1056
VD
HD/CS
B
G
R
GND
Y OUT
BWV
BLUE
GREEN
RED
PIONEER
CMK-P3X
B4→A5
CONTROL ASSY
A6
MULTI
R. OFF
G. OFF
B. OFF
V. MUTE
V. SMP
B5→A6
B7→A8
OSD R
OSD G
OSD B
YS
CONTROL ASSY
A8
V. PARA
H. PARA
H. SAW
CONVERGENCE ASSY
N9
B2→N9
B6→A7
CONTROL ASSY
A7
WHITE
R HI
G HI
B HI
R LV
G LV
B LV
CONTRAST
BRIGHT
COLOR
TINT
SHARP
CONTROL ASSY
A 5
VR2201
VR2202
VR2203 — VR2205
Q2018-Q2020
Q2015-Q2017
Q2009 Q2003 Q2004 Q2021 Q2002
Q2008 Q2001 Q2005-Q2007 Q2022 Q2205
IC2001 IC2002 IC2003 Q2010-Q2013
Q2206 Q2207 Q2208-Q2210
Q2204 Q2216 IC2203 Q2215 Q2235
Q2203 Q2236 Q2237 Q2217
Q2211
Q2212
Q2219 Q2251
Q2218 Q2214
Q2213 Q2221
IC2204
Q2220
Q2222-Q2229
Q2231 — Q2233
IC2202 IC2503 Q2511
Q2591 Q2566 Q2564 Q2567 Q2565
IC2201
Q2230
Q2534-Q2542
Q2545
Q2568
Q2593
Q2595
Q2594
Q2524 Q2530 Q2527 Q2525 Q2570 Q2531 Q2528 Q2526 Q2532 Q2529 Q2523
Q2592 Q2569 Q2512 Q2516 Q2515
Q2571 Q2514 Q2522
Q2584 — Q2589 Q2517-Q2519 IC2502 Q2513 Q2583
Q2546 — Q2553 Q2554 — Q2563 Q2590 Q2501 — Q2504
Q2544 IC2501 Q2505 — Q2510 Q2533 Q2572 Q2249 Q2573 — Q2582
Q2543 Q2241 Q2242 Q2250 Q2245 Q2202 Q2243 Q2248

5.7 R, G AND B CRT DRIVE ASSEMBLIES


SCH-7
(R) : R Signal route
(G) : G Signal route
(B) : B Signal route
R CRT DRIVE ASSY
(BWZ1651)
G CRT DRIVE ASSY
(BWZ1652)
B CRT DRIVE ASSY
(BWZ1653)
CRT ASSY (R)
CRT ASSY (G)
CRT ASSY (B)
H.V & DEFLECTION ASSY (2/2) C3 (→SCH-13)
VIDEO ASSY (3/3) B10 (→SCH-6)
VIDEO ASSY (3/3) B9 (→SCH-6)
VIDEO ASSY (3/3) B8 (→SCH-6)
D8
D7→D5
D5→D7
D6
D4→D2
D3
D2 →D4
D1
+220V
HT.-
HT.+
•V.BLK
W.SW
13.5V
R.IK
G.IK
B.IK
GND
R
G
B
9V
SCREEN
FOCUS
R.K
G.K
B.K
2SA1371
2SC2611
2SC3468
1SS145-TP
Q4004
Q4005
Q4007
Q4104
Q4105
Q4107
Q4204
Q4205
Q4207
C4001 100/25
C4101 100/25
C4201 100/25
TP4005 GND ZX-009
TP4105 GND ZX-009
TP4205 GND ZX-009
J4051 ADX2198
J4151 ADX2198
J4250 ADX2198

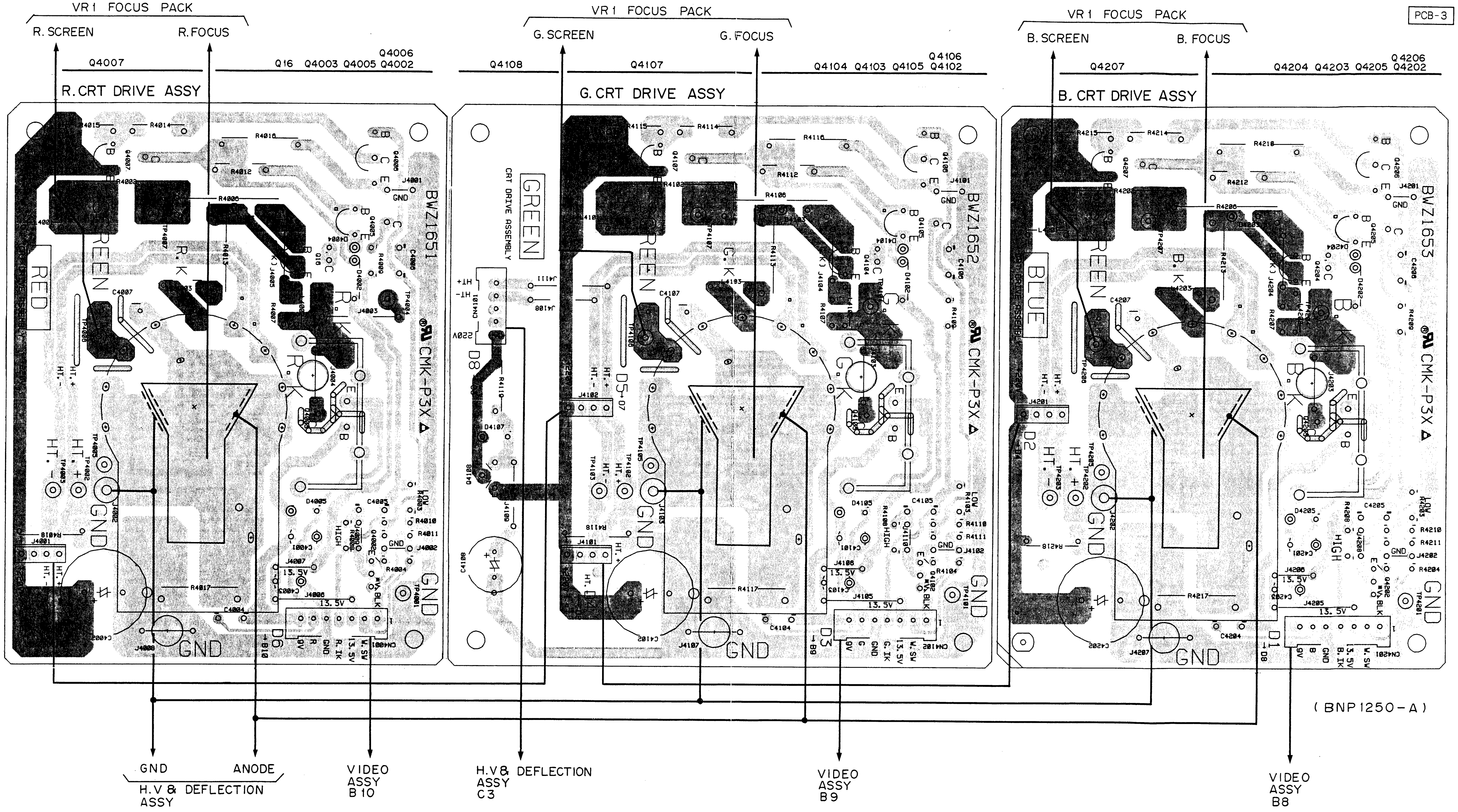
NOTE

RESISTORS; indicated.1/8 W 5%
tolerance unless otherwise
noted k;k

CAPACITORS; Indicated.Capacity (F)/ Voltage(V)
unless otherwise noted p;pF
Indicated without Voltage is 50V
except electrolytic Capacity

SCH-7 R CRT DRIVE ASSY,
G CRT DRIVE ASSY,
B CRT DRIVE ASSY

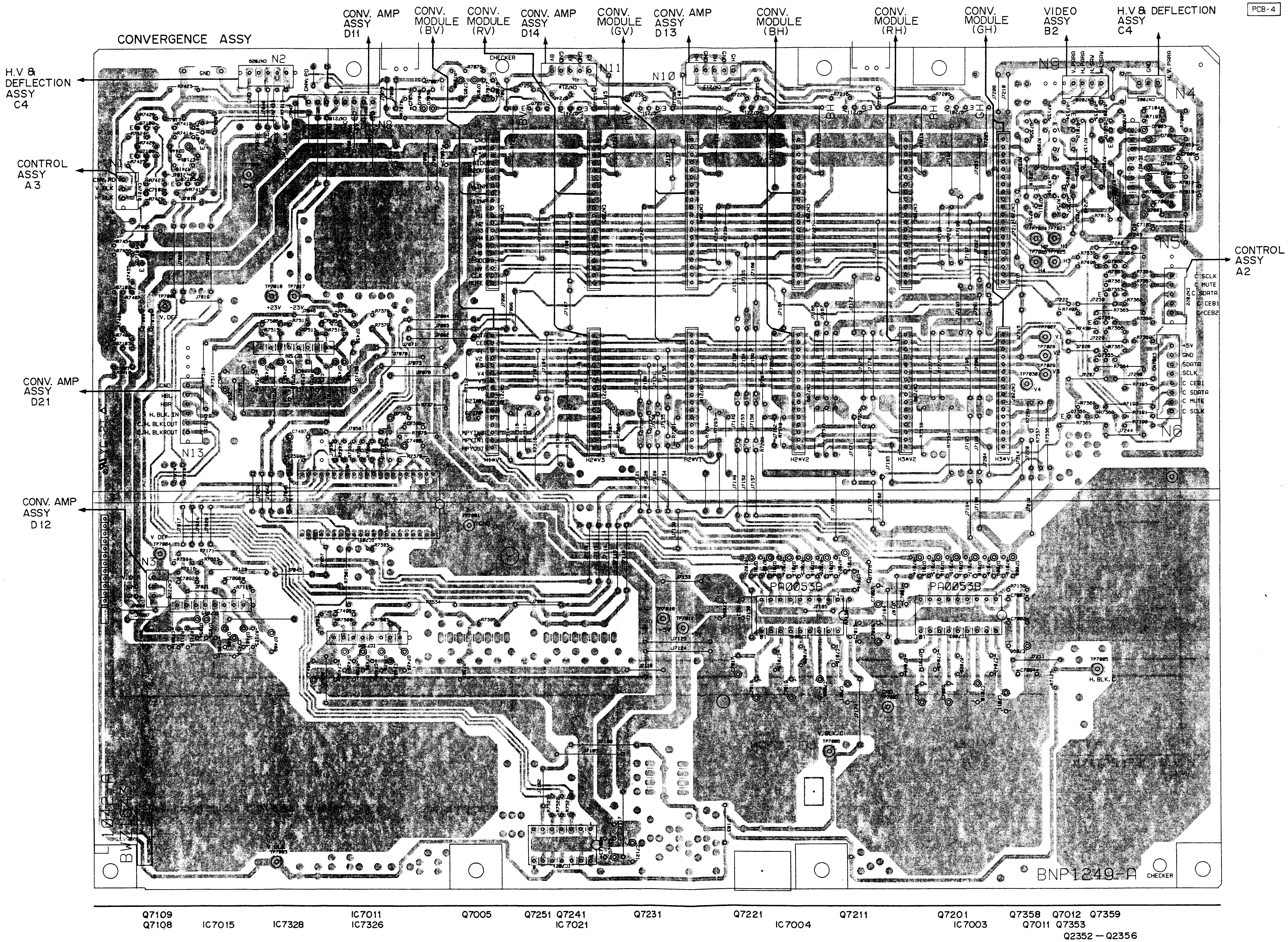
R CRT DRIVE ASSY,
G CRT DRIVE ASSY,
B CRT DRIVE ASSY **SCH-7**


VR1 FOCUS PACK
R. SCREEN
R. FOCUS
Q4007
Q16 Q4003 Q4005 Q4002
Q4006
R. CRT DRIVE ASSY
RED
BWZ1651
CMK-P3X
VR1 FOCUS PACK
G. SCREEN
G. FOCUS
Q4108
Q4107
Q4104 Q4103 Q4105 Q4102
Q4106
G. CRT DRIVE ASSY
GREEN
CRT DRIVE ASSEMBLY
BWZ1652
CMK-P3X
VR1 FOCUS PACK
B. SCREEN
B. FOCUS
Q4207
Q4204 Q4203 Q4205 Q4202
Q4206
B. CRT DRIVE ASSY
BLUE
BWZ1653
CMK-P3X
GND
(BNP1250-A)
GND
ANODE
H.V & DEFLECTION ASSY
VIDEO ASSY B10
H.V& DEFLECTION ASSY C3
VIDEO ASSY B9
VIDEO ASSY B8

● This diagram is viewed from the mounted parts side.

▨ mark shows a high voltage generation point (excepting the charged section).

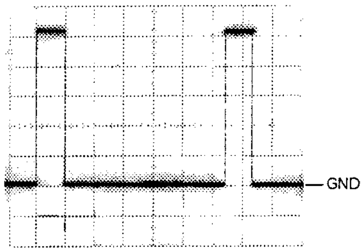
5.8 CONVERGENCE ASSY


PCB-4
CONVERGENCE ASSY
CONV. AMP ASSY D11
CONV. MODULE (BV)
CONV. MODULE (RV)
CONV. AMP ASSY D14
CONV. MODULE (GV)
CONV. AMP ASSY D13
CONV. MODULE (BH)
CONV. MODULE (RH)
CONV. MODULE (GH)
VIDEO ASSY B2
H.V & DEFLECTION ASSY C4
H.V & DEFLECTION ASSY C4
CONTROL ASSY A3
CONV. AMP ASSY D21
CONV. AMP ASSY D12
CONTROL ASSY A2
N2
N3
N4
N5
N6
N8
N9
N10
N11
N13
CHECKER
PA0053B
PA0053B
BNP1249-A
CHECKER
H. BLK.
+25V
-23V
Q7109
Q7108
IC7015
IC7328
IC7011
IC7326
Q7005
Q7251 Q7241
IC7021
Q7231
Q7221
IC7004
Q7211
Q7201
IC7003
Q7358 Q7012 Q7359
Q7011 Q7353
Q2352 — Q2356

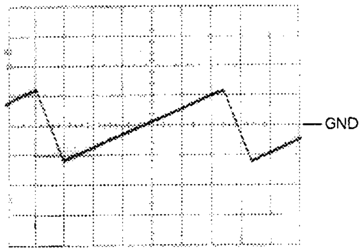
• This diagram is viewed from the mounted parts side.

Waveformes at CONVERGENCE ASSY

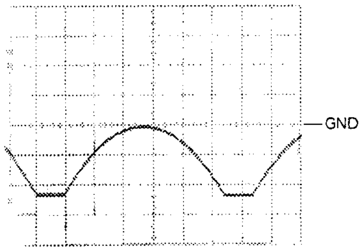
① TP7005 (C.H.BLK)
V : 1V/div, H : 10μsec/div



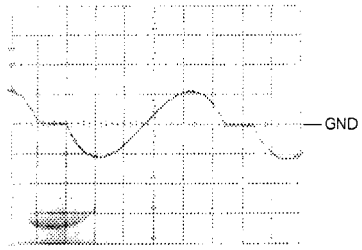
② D7008 cathode (H1)
H : 1V/div, V : 10μsec/div



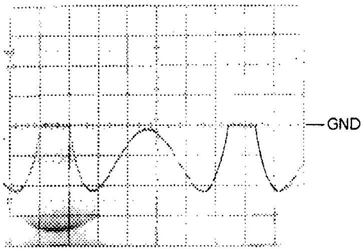
③ D7009 cathode (H2)
H : 1V/div, V : 10μsec/div



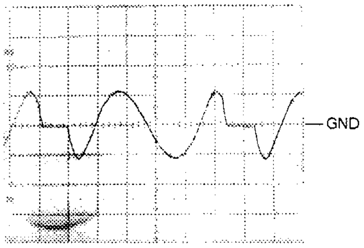
④ D7010 cathode (H3)
H : 1V/div, V : 10μsec/div



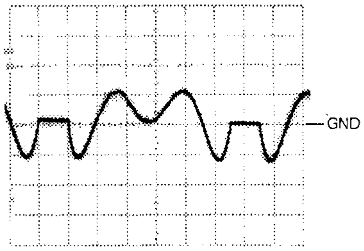
⑤ D7011 cathode (H4)
H : 1V/div, V : 10μsec/div



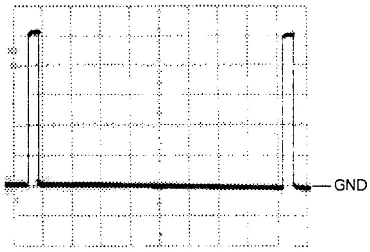
⑥ D7012 cathode (H5)
H : 1V/div, V : 10μsec/div



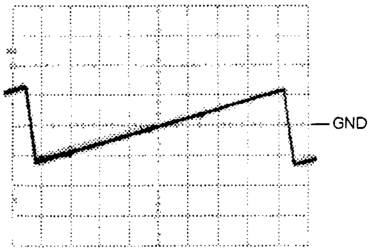
⑦ D7013 cathode (H6)
H : 1V/div, V : 10μsec/div



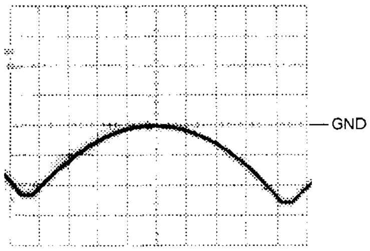
⑧ TP7006 (C.V.BLK)
H : 1V/div, V : 2msec/div



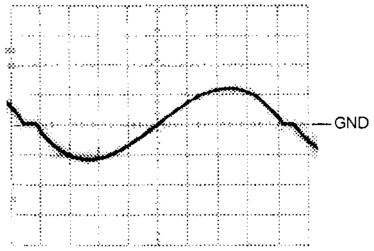
⑨ D7014 cathode (V1)
H : 1V/div, V : 0.2msec/div



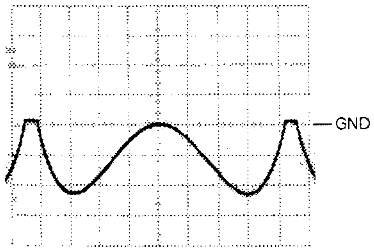
⑩ D7015 cathode (V2)
H : 1V/div, V : 0.2msec/div



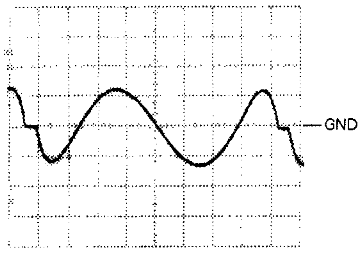
⑪ D7016 cathode (V3)
H : 1V/div, V : 0.2msec/div



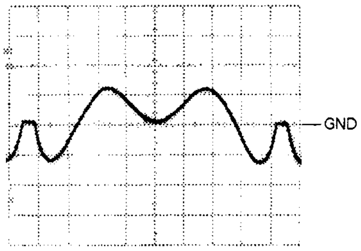
⑫ D7017 cathode (V4)
H : 1V/div, V : 0.2msec/div



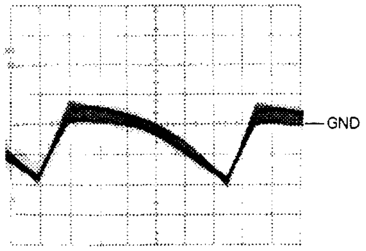
⑬ D7018 cathode (V5)
H : 1V/div, V : 0.2msec/div



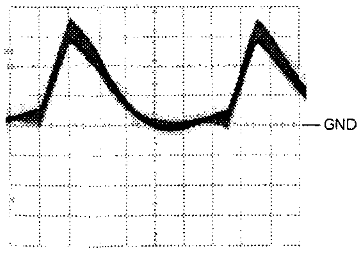
⑭ D7019 cathode (V6)
H : 1V/div, V : 0.2msec/div



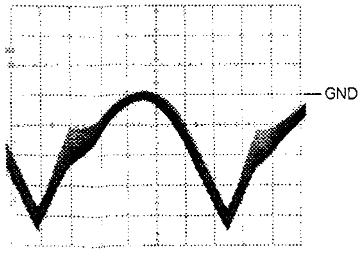
⑮ N10-1 pin (GH)
V : 0.2V/div, H : 10μsec/div



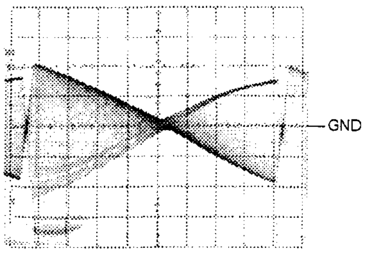
⑯ N10-3 pin (RH)
V : 0.2V/div, H : 10μsec/div



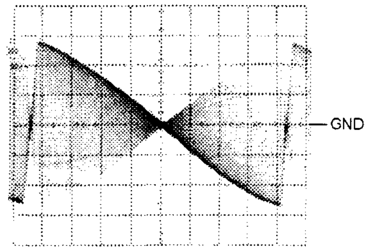
⑰ N10-5 pin (BH)
V : 0.2V/div, H : 10μsec/div



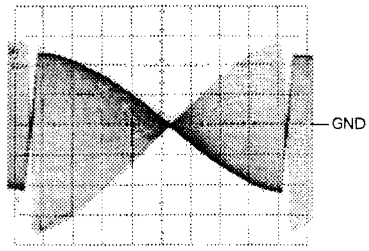
⑱ N11-1 pin (GV)
H : 0.2V/div, V : 0.2msec/div



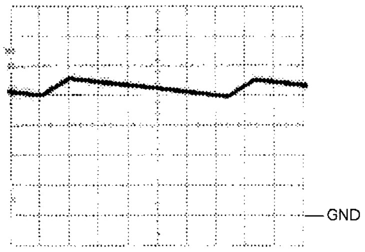
⑲ N11-3 pin (RV)
H : 0.2V/div, V : 0.2msec/div



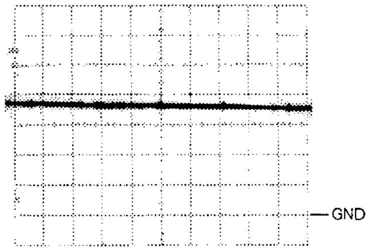
⑳ N11-5 pin (BV)
H : 0.2V/div, V : 0.2msec/div



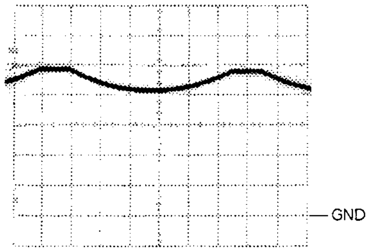
㉑ N9-1 pin (＊H.SAW)
V : 2V/div, H : 10μsec/div



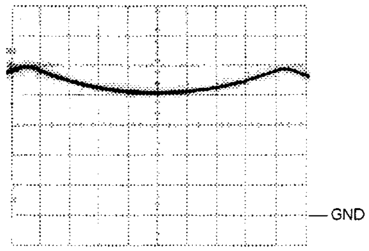
㉒ N9-2 pin (H.SAW)
V : 2V/div, H : 10μsec/div



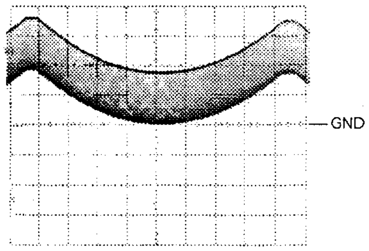
㉓ N9-3 pin (H.PARA)
V : 2V/div, H : 10μsec/div



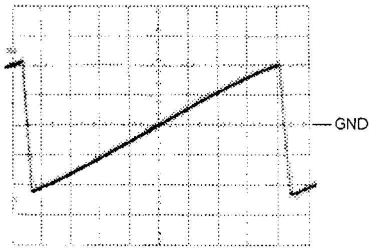
㉔ N9-4 pin (V.PARA)
H : 2V/div, V : 0.2msec/div

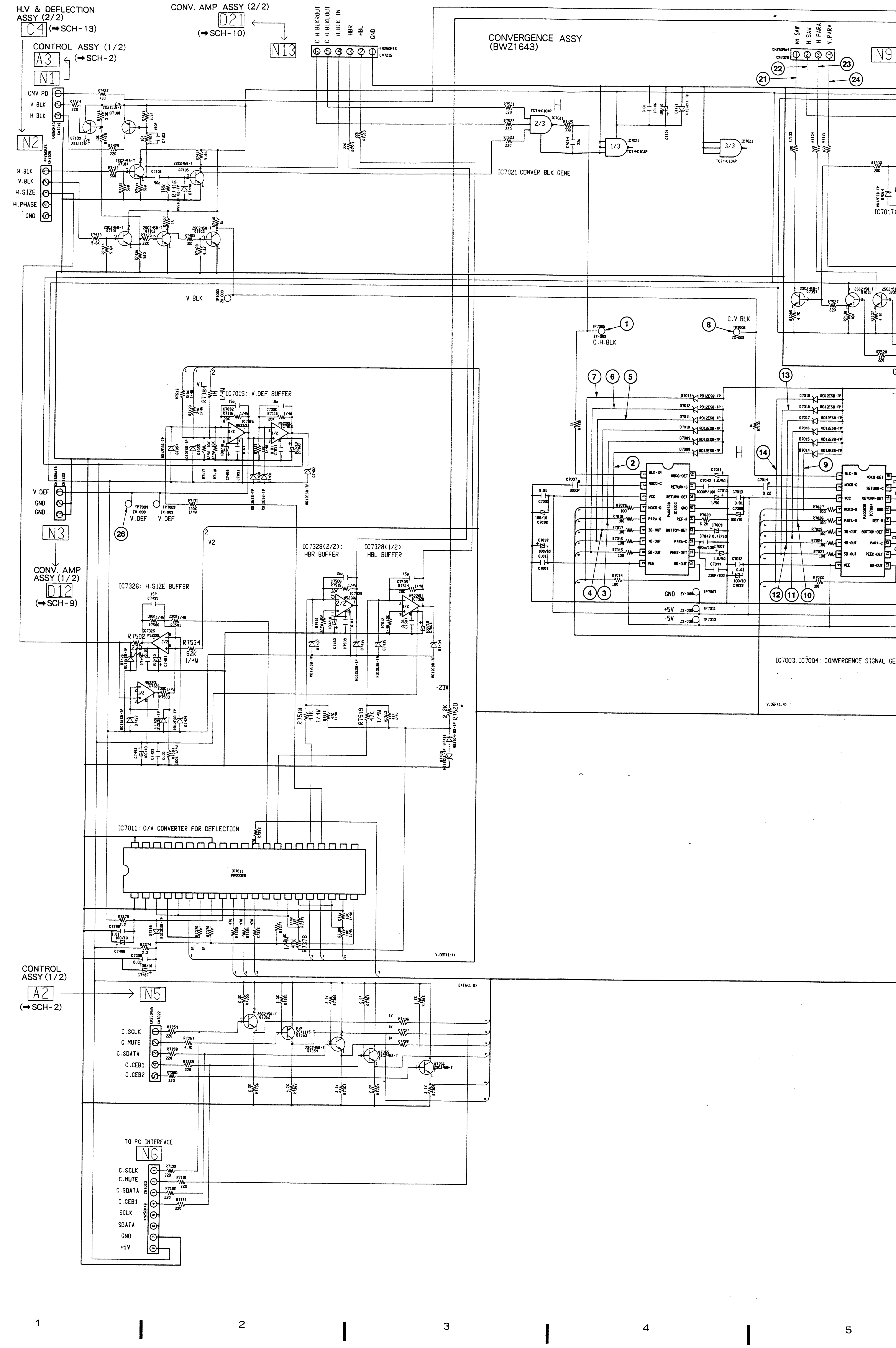


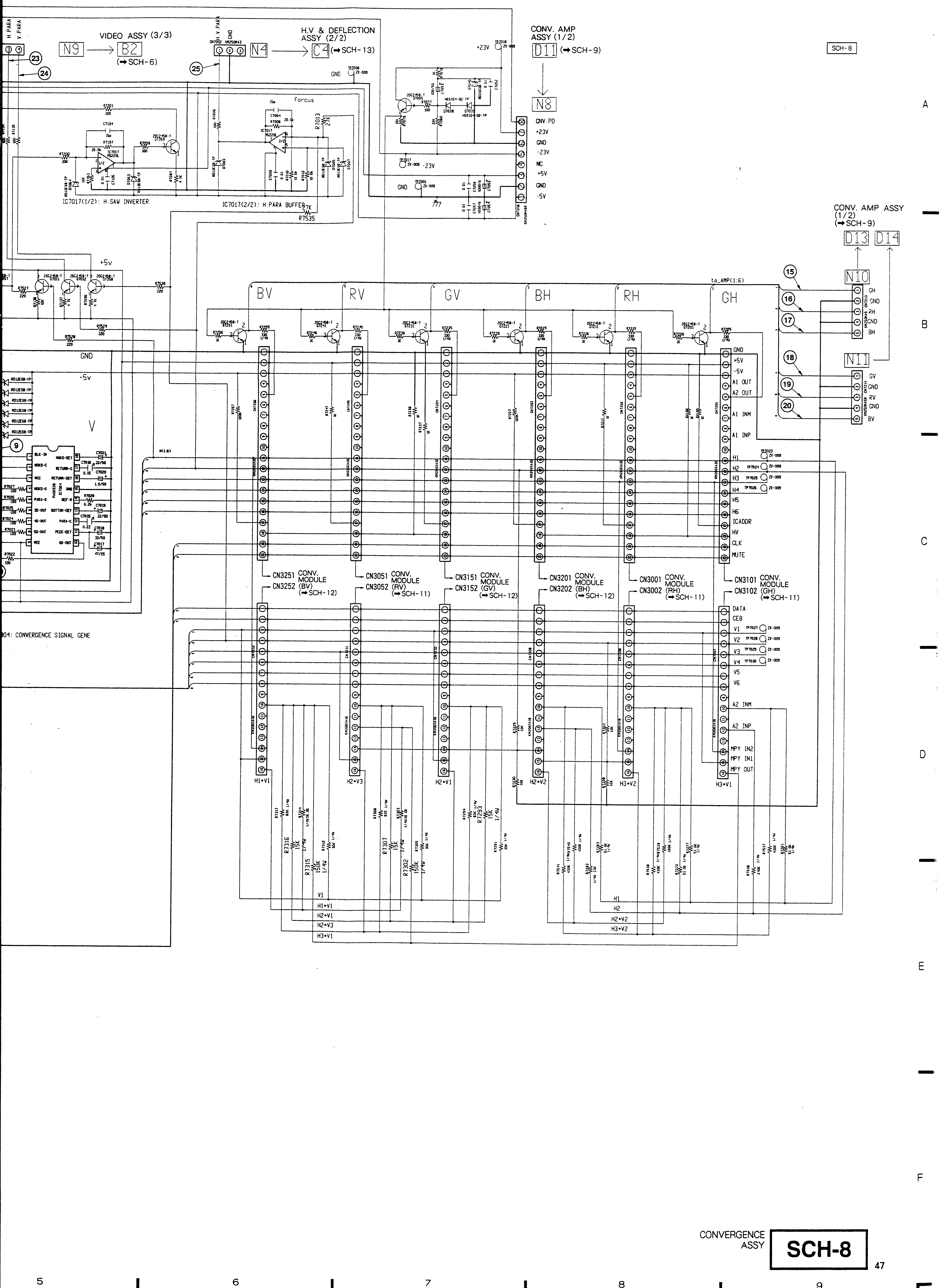
㉕ N4-1 pin (H.V.PARA)
H : 1V/div, V : 0.2msec/div



㉖ TP7001 (V.DEF)
H : 0.5V/div, V : 0.2msec/div



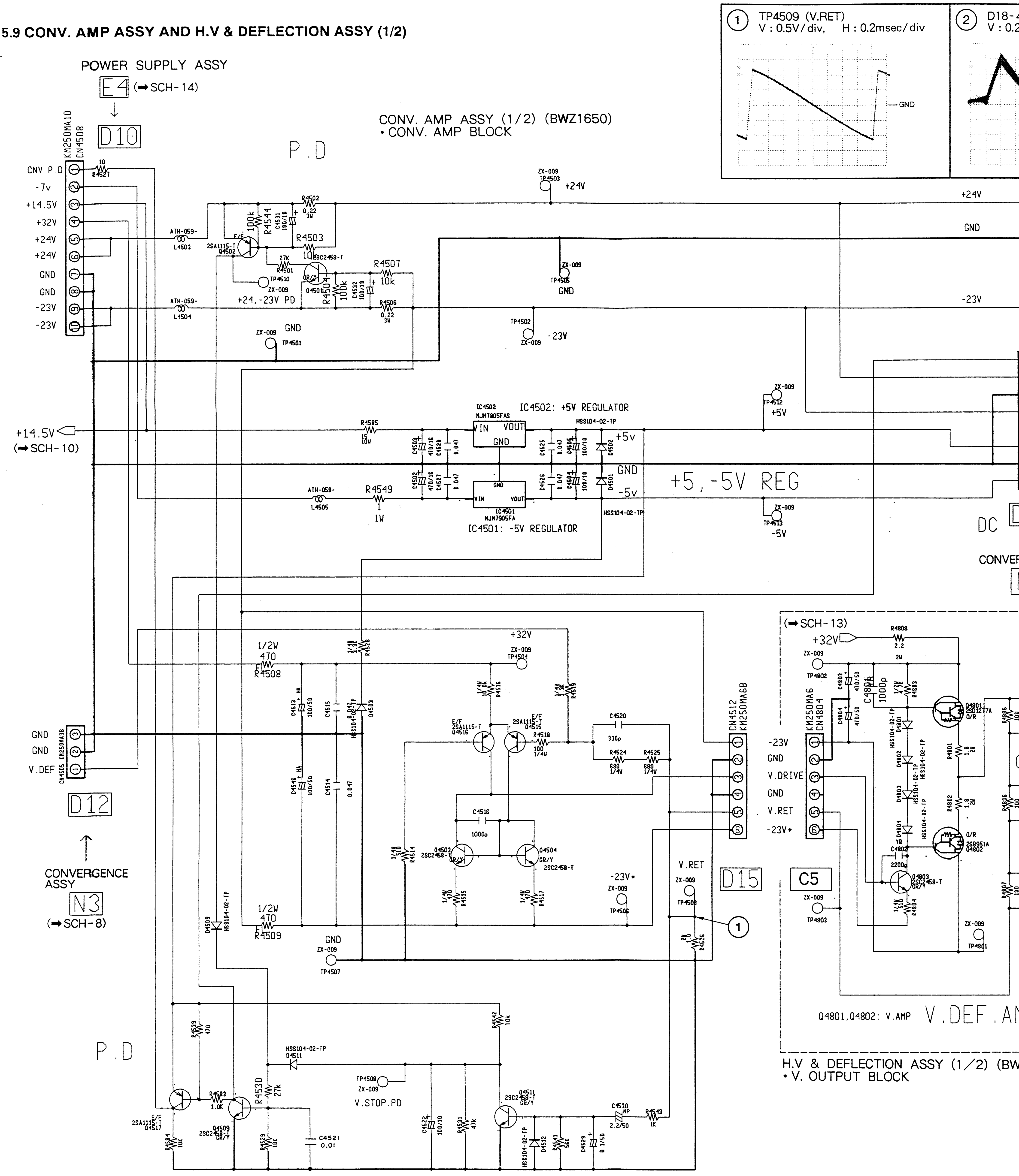

H.V & DEFLECTION ASSY (2/2)
C4 (➡SCH-13)
CONV. AMP ASSY (2/2)
D21
(➡SCH-10)
CONTROL ASSY (1/2)
A3 (➡SCH-2)
N1
N13
C.H.BLKROUT
C.H.BLKLOUT
H.BLK IN
HBR
HBL
GND
CONVERGENCE ASSY (BWZ1643)
H.SAW
H.SAW
H.PARA
V.PARA
N9
CNV.PD
V.BLK
H.BLK
N2
H.BLK
V.BLK
H.SIZE
H.PHASE
GND
IC7021:CONVER BLK GENE
V.BLK
C.H.BLK
C.V.BLK
IC7015: V.DEF BUFFER
V.DEF
GND
GND
N3
CONV. AMP ASSY (1/2)
D12
(➡SCH-9)
V.DEF
V.DEF
V2
IC7326: H.SIZE BUFFER
IC7328(2/2): HBR BUFFER
IC7328(1/2): HBL BUFFER
GND
+5V
-5V
IC7003.IC7004: CONVERGENCE SIGNAL GE
-23V
IC7011: D/A CONVERTER FOR DEFLECTION
IC7011 PM0002B
CONTROL ASSY (1/2)
A2
(➡SCH-2)
N5
C.SCLK
C.MUTE
C.SDATA
C.CEB1
C.CEB2
TO PC INTERFACE
N6
C.SCLK
C.MUTE
C.SDATA
C.CEB1
SCLK
SDATA
GND
+5V
1
2
3
4
5

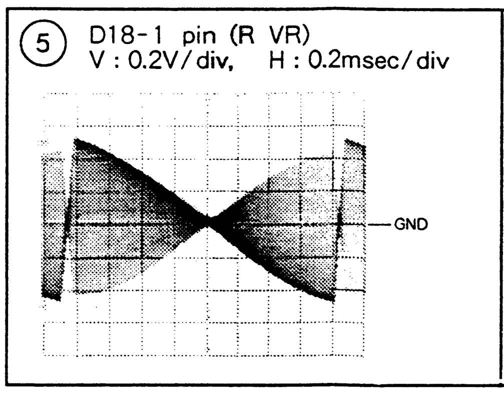

SCH-8
H PARA
V PARA
VIDEO ASSY (3/3)
N9
B2
(➡SCH-6)
23
24
25
H.V PARA
GND
CN7002
KM250NA3
N4
H.V & DEFLECTION ASSY (2/2)
C4
(➡SCH-13)
GND
TP7008 ZX-009
+23V
TP7018 ZX-009
CONV. AMP ASSY (1/2)
D11
(➡SCH-9)
N8
CNV.PD
+23V
GND
-23V
NC
+5V
GND
-5V
CN7216
TP7017 ZX-009
-23V
GND
TP7001 ZX-009
2SC2458-T Q7005
HSS104-02-TP D7038
HSS104-02-TP D7039
R7201 100
C7104
R7197
R7198 20.0k
R7200 20K
IC7017 M5220L
R7098 100
2SC2458-T Q7353
C7005
IC7017(1/2): H.SAW INVERTER
Forcus
C7004
R7008 20.0k
IC7017 M5220L
R1013 27K
IC7017(2/2): H.PARA BUFFER
27K
R7535
+5V
2SC2458-T Q7011
2SC2458-T Q7012
2SC2458-T Q7358
R7527 220
R7530 220
R7529 220
R7528 220
GND
-5V
RD12ES8-TP
V
9
BLK-IN
NOKO-C
VCC
NOKO-O
PARA-O
3D-OUT
4D-OUT
5D-OUT
VEE
NOKO-DET
RETURN-C
RETURN-DET
GND
REF-R
BOTTOM-DET
PARA-C
PEEK-DET
6D-OUT
PA0053B IC7004
C7021 22/50
C7016 0.15
C7020 1.5/50
R7029 6.2K
C7019 22/50
C7015 0.22
C7018 33/50
C7017 47/25
R7027 100
R7026 100
R7025 100
R7024 100
R7023 100
R7022 100
H(1:6)
04: CONVERGENCE SIGNAL GENE
CONV. AMP ASSY (1/2)
(➡SCH-9)
D13
D14
to_AMP(1:6)
15
16
17
18
19
20
N10
GH
GND
RH
GND
BH
CN7213
N11
GV
GND
RV
GND
BV
CN7214
BV
RV
GV
BH
RH
GH
2SC2458-T Q7251
2SC2458-T Q7241
2SC2458-T Q7231
2SC2458-T Q7221
2SC2458-T Q7211
2SC2458-T Q7201
R7256 1K
R7255 330 1/4W
R7246 1K
R7245 330 1/4W
R7236 1K
R7235 330 1/4W
R7226 1K
R7225 330 1/4W
R7216 1K
R7215 330 1/4W
R7206 1K
R7205 330 1/4W
CN7206
CN7205
CN7204
CN7203
CN7202
CN7201
GND
+5V
-5V
A1 OUT
A2 OUT
A1 INM
A1 INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
TP7023 ZX-009
TP7024 ZX-009
TP7025 ZX-009
TP7026 ZX-009
CN3251 CONV. MODULE
CN3252 (BV)
(➡SCH-12)
CN3051 CONV. MODULE
CN3052 (RV)
(➡SCH-11)
CN3151 CONV. MODULE
CN3152 (GV)
(➡SCH-12)
CN3201 CONV. MODULE
CN3202 (BH)
(➡SCH-12)
CN3001 CONV. MODULE
CN3002 (RH)
(➡SCH-11)
CN3101 CONV. MODULE
CN3102 (GH)
(➡SCH-11)
DATA
CEB
V1
V2
V3
V4
V5
V6
A2 INM
A2 INP
MPY IN2
MPY IN1
MPY OUT
TP7027 ZX-009
TP7028 ZX-009
TP7029 ZX-009
TP7030 ZX-009
CN7212
CN7211
CN7210
CN7209
CN7208
CN7207
H1•V1
H2•V3
H2•V1
H2•V2
H3•V2
H3•V1
R7316 15K 1/4W
R7315 150K 1/4W
R7307 15K 1/4W
R7302 150K 1/4W
R7293 15K 1/4W
V1
H1•V1
H2•V1
H2•V3
H3•V1
H1
H2
H2•V2
H3•V2
A
B
C
D
E
F
5
6
7
8
9

CONVERGENCE ASSY

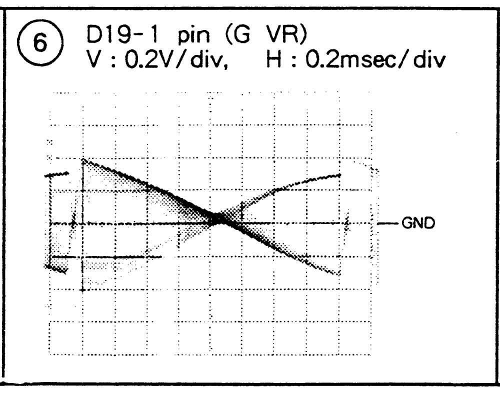
SCH-8

5.9 CONV. AMP ASSY AND H.V & DEFLECTION ASSY (1/2)

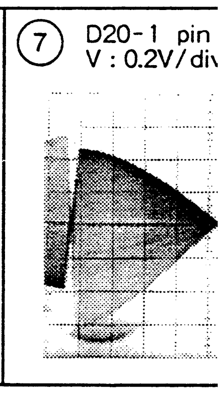

POWER SUPPLY ASSY
E4 (➡SCH-14)
D10
KM250MA10
CN4508
CNV P.D
-7v
+14.5V
+32V
+24V
+24V
GND
GND
-23V
-23V
R4527
ATH-059- L4503
ATH-059- L4504
P.D
CONV. AMP ASSY (1/2) (BWZ1650)
• CONV. AMP BLOCK
2SA1115-T Q4502
R4544 100k
C4531 100/10
R4502 0.22 3W
R4503 10k
R4501 27K
2SC2458-T Q4501
R4504 100k
C4532 100/10
R4507 10k
R4506 0.22 3W
TP4510 ZX-009
+24,-23V PD
ZX-009 TP4501 GND
ZX-009 TP4503 +24V
ZX-009 TP4505 GND
TP4502 ZX-009 -23V
① TP4509 (V.RET)
V : 0.5V/div, H : 0.2msec/div
GND
② D18-
+24V
GND
-23V
+14.5V (➡SCH-10)
R4505 15 10W
IC4502 NJM7805FAS
IC4502: +5V REGULATOR
VIN VOUT GND
C4503 470/16
C4528 0.047
C4525 0.047
C4505 100/10
D4502 HSS104-02-TP
+5v
GND
-5v
ATH-059- L4505
R4549 1 1W
C4502 470/16
C4527 0.047
C4526 0.047
C4504 100/10
D4501 HSS104-02-TP
IC4501 NJM7905FA
IC4501: -5V REGULATOR
+5, -5V REG
ZX-009 TP4512 +5V
ZX-009 TP4513 -5V
DC
CONVER
+32V
ZX-009 TP4504
1/2W 470 R4508
R4528
C4513 100/50
C4515
C4517 0.047
D4503 HSS104-02-TP
R4516
R4519
2SA1115-T Q4516
2SA1115-T Q4515
R4518 100 1/4W
C4520 330p
R4524 680 1/4W
R4525 680 1/4W
C4546 100/50
C4514 0.047
C4516 1000p
R4514
Q4503 2SC2458-T GR/Y
Q4504 GR/Y 2SC2458-T
R4515
R4517
-23V•
ZX-009 TP4506
V.RET
ZX-009 TP4509
R4526
①
CN4512 KM250MA6B
D15
GND
GND
V.DEF
CN4505 KM250MA3B
D12
CONVERGENCE ASSY
N3 (➡SCH-8)
D4509 HSS104-02-TP
1/2W 470 R4509
GND ZX-009 TP4507
(➡SCH-13)
+32V
R4808 2.2 2W
ZX-009 TP4802
C4803 470/50
C4804 470/50
C4801 1000p
R4803
KM250MA6 CN4804
-23V
GND
V.DRIVE
GND
V.RET
-23V•
D4801 HSS104-02-TP
D4802 HSS104-02-TP
D4803 HSS104-02-TP
D4804
R4801
R4802
Q4801 2SD1277A Q/R
Q/R 2SB951A Q4802
C4802 2200p
Q4803 2SC2458-T GR/Y
R4804
C5
ZX-009 TP4803
ZX-009 TP4801
Q4801, Q4802: V.AMP
V.DEF.AM
H.V & DEFLECTION ASSY (1/2) (BW
• V. OUTPUT BLOCK
P.D
R4539 470
R4542 10K
HSS104-02-TP D4511
TP4508 ZX-009
V.STOP.PD
2SA1115-T Q4517
R4583 1.0K
Q4509 2SC2458-T GR/Y
R4530 27k
R4584 10K
R4529 10K
C4521 0.01
C4522 100/10
R4531 47k
2SC2458-T Q4511 GR/Y
D4512 HSS104-02-TP
R4541 68K
C4529 0.1/50
C4530 NP 2.2/50
R4543 1K



⑤ D18-1 pin (R VR)
V : 0.2V/div, H : 0.2msec/div

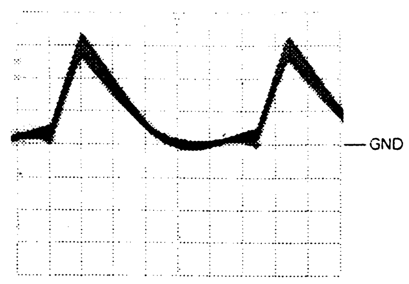


⑥ D19-1 pin (G VR)
V : 0.2V/div, H : 0.2msec/div

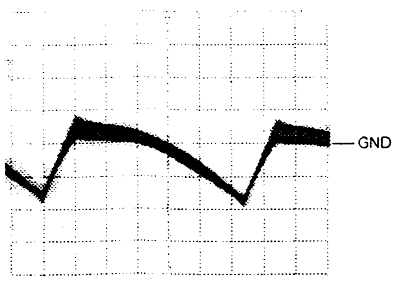


⑦ D20-1 pin
V : 0.2V/di

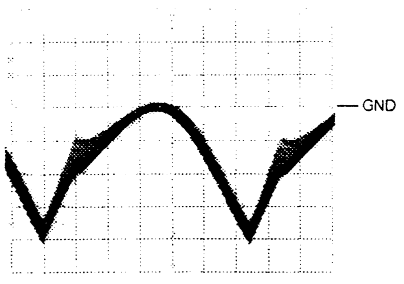
② D18-4 pin (R HR)
V : 0.2V/div, H : 10 μsec/div



③ D19-4 pin (G HR)
V : 0.2V/div, H : 10 μsec/div

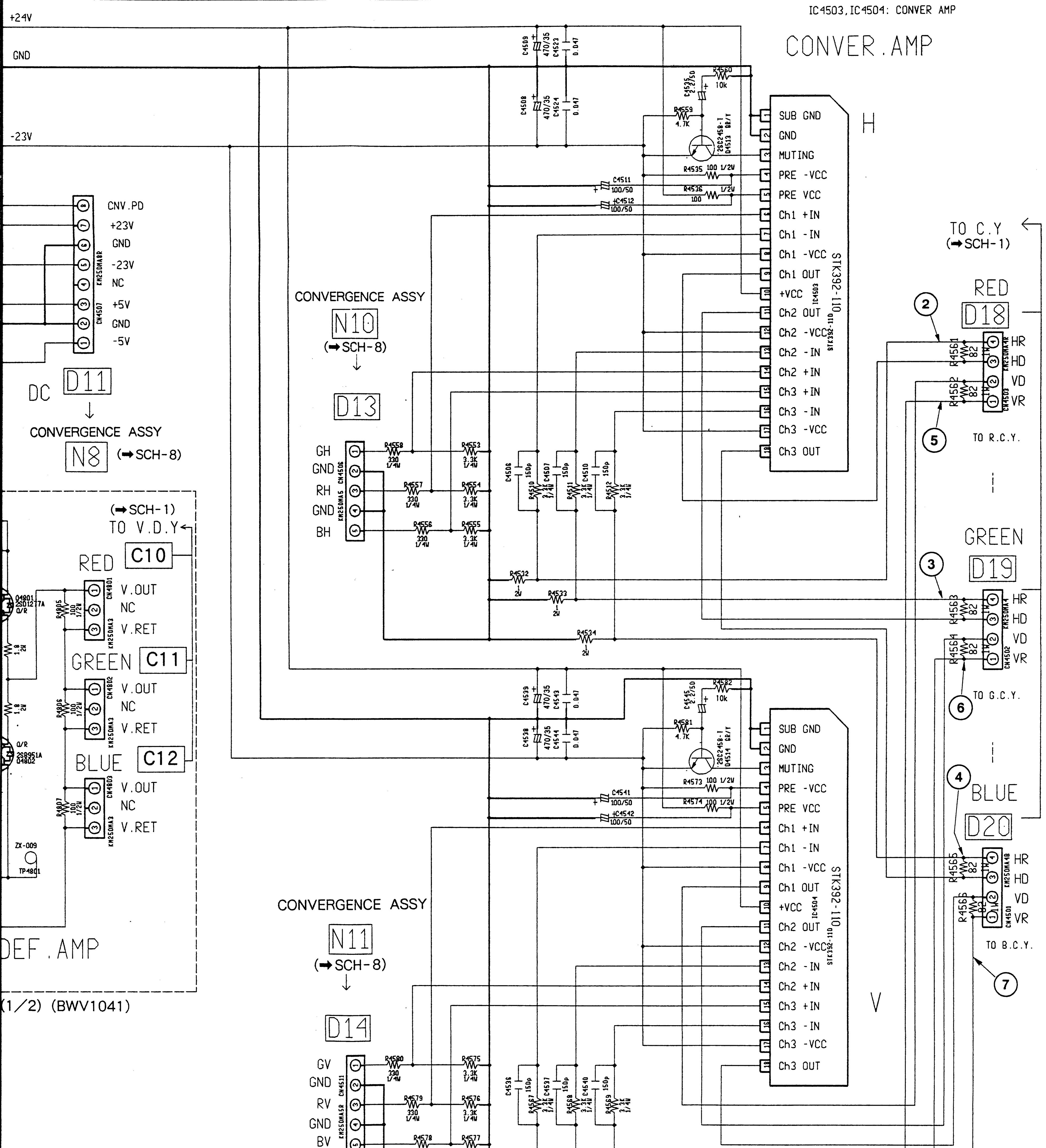


④ D20-4 pin (B HR)
V : 0.2V/div, H : 10 μsec/div

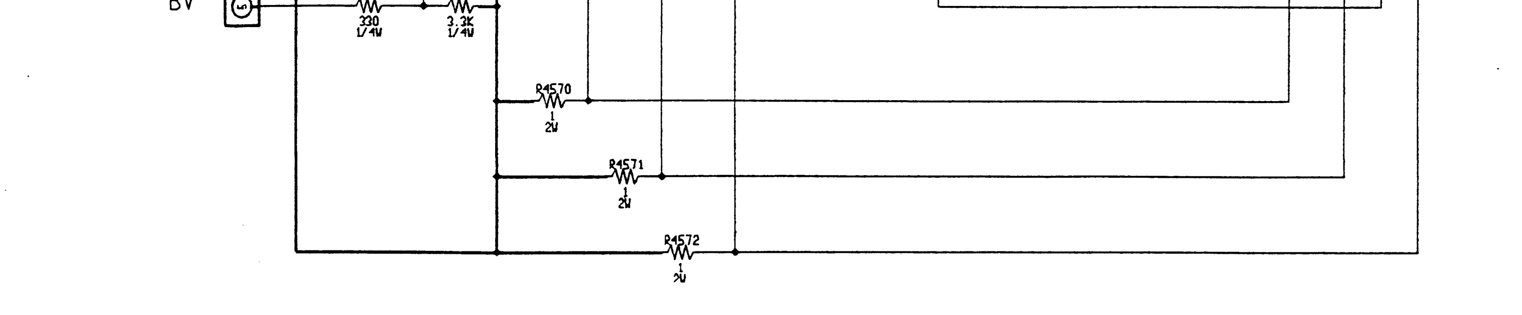


SCH-9

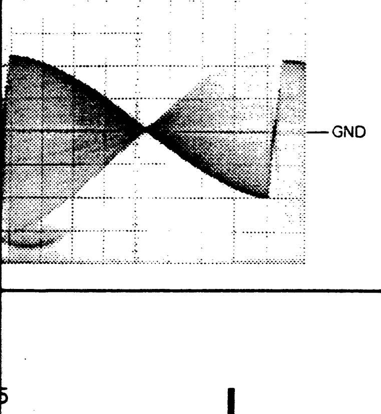
IC4503, IC4504: CONVER AMP


+24V
GND
-23V
CONVER. AMP
H
V
STK392-110
IC4503
IC4504
SUB GND
GND
MUTING
PRE -VCC
PRE VCC
Ch1 +IN
Ch1 -IN
Ch1 -VCC
Ch1 OUT
+VCC
Ch2 OUT
Ch2 -VCC
Ch2 -IN
Ch2 +IN
Ch3 +IN
Ch3 -IN
Ch3 -VCC
Ch3 OUT
CNV.PD
+23V
GND
-23V
NC
+5V
GND
-5V
CN4507
KM250MA8R
DC
D11
CONVERGENCE ASSY
N8
(➡SCH-8)
CONVERGENCE ASSY
N10
(➡SCH-8)
D13
GH
GND
RH
GND
BH
CN4506
KM250MA5
CONVERGENCE ASSY
N11
(➡SCH-8)
(➡SCH-1)
TO V.D.Y
RED
C10
GREEN
C11
BLUE
C12
V.OUT
NC
V.RET
CN4801
CN4802
CN4803
KM250MA3
Q4801
2SD1217A
Q4802
2SB951A
Q/R
R4805
R4806
R4807
ZX-009
TP4801
DEF. AMP
TO C.Y
(➡SCH-1)
RED
D18
GREEN
D19
BLUE
D20
HR
HD
VD
VR
CN4503
CN4502
CN4501
KM250MA4R
TO R.C.Y.
TO G.C.Y.
TO B.C.Y.
②
③
④
⑤
⑥
⑦
R4561
R4562
R4563
R4564
R4565
R4566
82
C4509
C4523
C4508
C4524
470/35
0.047
C4539
C4543
C4538
C4544
C4535
C4545
2.2/50
R4560
R4582
10k
R4559
R4581
4.7K
2SC2458-1
Q4513
Q4514
GR/Y
R4535
R4536
R4573
R4574
100 1/2W
C4511
C4512
C4541
C4542
100/50
R4558
R4557
R4556
330 1/4W
R4553
R4554
R4555
3.3K 1/4W
C4506
C4507
C4510
150p
R4510
R4511
R4512
R4532
R4533
R4534
2W

(1/2) (BWV1041)


D14
GV
GND
RV
GND
BV
CN4511
KM250MA5R
R4580
R4579
R4578
330 1/4W
R4575
R4576
R4577
3.3K 1/4W
C4536
C4537
C4540
150p
R4567
R4568
R4569
R4570
R4571
R4572
2W

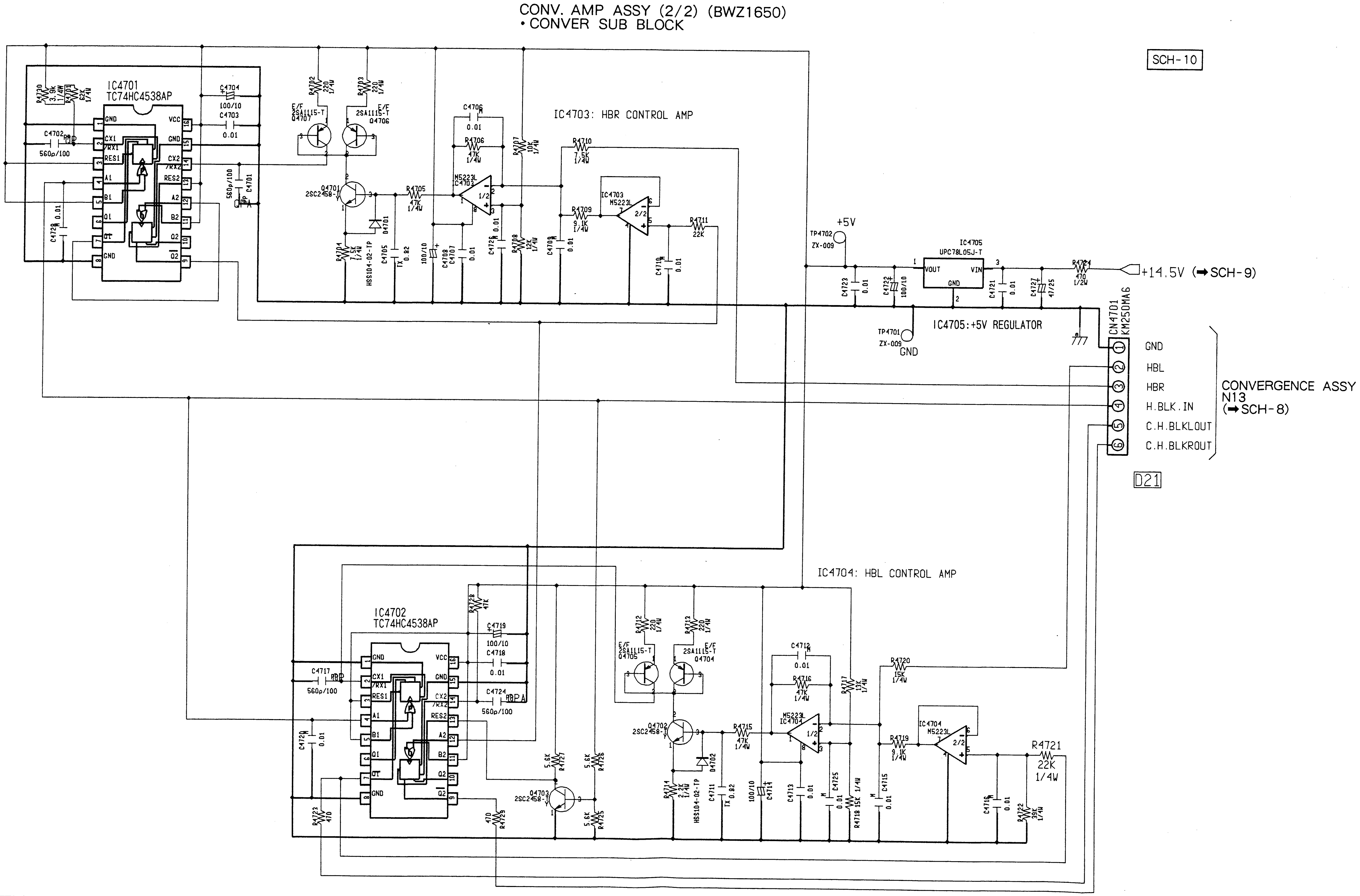
D20-1 pin (B VR)
V : 0.2V/div, H : 0.2msec/div



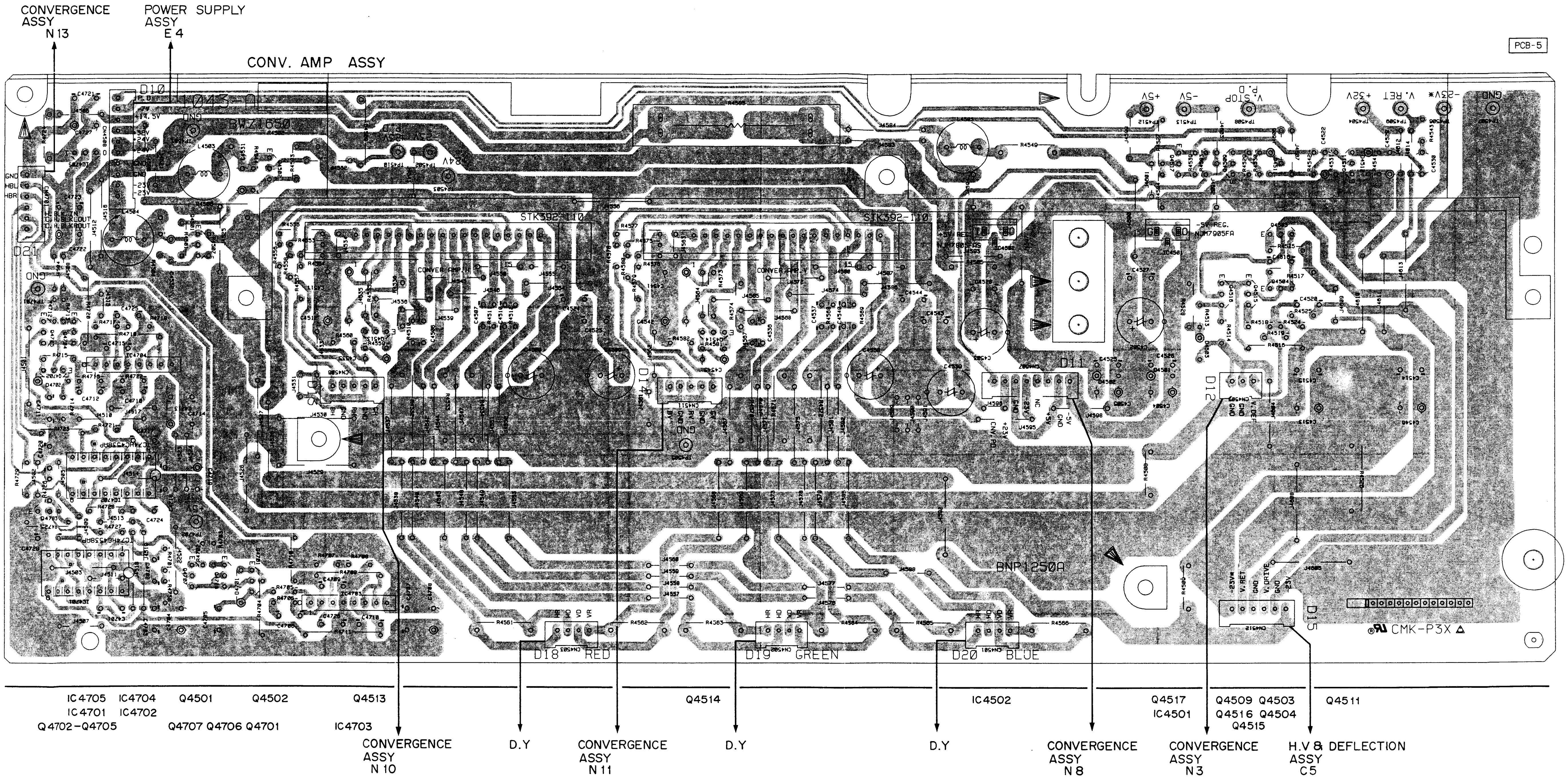
CONV. AMP
ASSY (1/2),
H.V & DEFLECTION
ASSY (1/2)

SCH-9

5.10 CONV. AMP ASSY (2/2)


CONV. AMP ASSY (2/2) (BWZ1650)
• CONVER SUB BLOCK
SCH-10
IC4701
TC74HC4538AP
R4730 3.9K 1/4W
R4731 62K 1/4W
C4704 100/10
C4703 0.01
C4702 560p/100
C4728 0.01
C4701 560p/100
R4702 220 1/4W
R4703 220 1/4W
E/F 2SA1115-T Q4707
E/F 2SA1115-T Q4706
Q4701 2SC2458-Y
R4704 7.5K 1/4W
D4701 HSS104-02-TP
C4705 0.82
C4706 0.01
R4706 47K 1/4W
R4705 47K 1/4W
R4707 10K 1/4W
M5223L IC4703
C4708 100/10
C4707 0.01
C4726 0.01
R4708 12K 1/4W
IC4703: HBR CONTROL AMP
R4710 7.5K 1/4W
R4709 9.1K 1/4W
C4709 0.01
IC4703 M5223L 2/2
R4711 22K
C4710 0.01
TP4702 ZX-009
+5V
IC4705 UPC78L05J-T
VOUT VIN GND
C4723 0.01
C4722 100/10
C4721 0.01
C4727 47/25
R4724 470 1/2W
+14.5V (➡SCH-9)
TP4701 ZX-009 GND
IC4705:+5V REGULATOR
CN4701 KM250MA6
GND
HBL
HBR
H.BLK.IN
C.H.BLKLOUT
C.H.BLKROUT
CONVERGENCE ASSY N13 (➡SCH-8)
D21
IC4702
TC74HC4538AP
R4728 47K
C4719 100/10
C4718 0.01
C4717 560p/100
C4724 560p/100
C4720 0.01
R4723 470
R4729 470
R4727 5.6K
R4726 5.6K
R4725 5.6K
Q4703 2SC2458-Y
IC4704: HBL CONTROL AMP
R4712 220 1/4W
R4713 220 1/4W
E/F 2SA1115-T Q4705
E/F 2SA1115-T Q4704
Q4702 2SC2458-Y
R4714 7.5K 1/4W
D4702 HSS104-02-TP
C4711 0.82
C4714 100/10
R4715 47K 1/4W
C4712 0.01
R4716 47K 1/4W
M5223L IC4704 1/2
C4713 0.01
C4725 0.01
R4718 15K 1/4W
R4717 13K 1/4W
C4715 0.01
R4720 15K 1/4W
R4719 9.1K 1/4W
IC4704 M5223L 2/2
R4721 22K 1/4W
C4716 0.01
R4722 39K 1/4W
GND VCC CX1 RX1 RES1 A1 B1 Q1 Q̄1 CX2 RX2 RES2 A2 B2 Q2 Q̄2

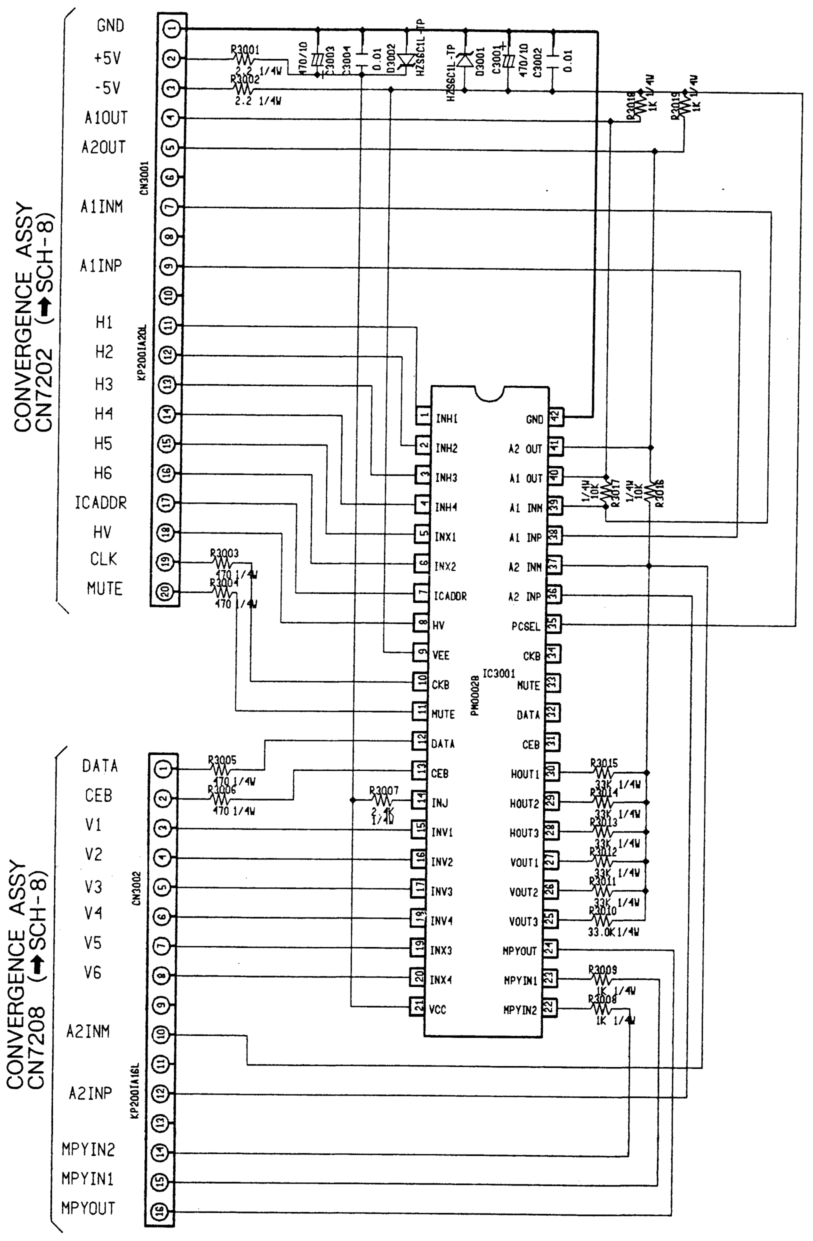
CONV. AMP ASSY


PCB-5
CONVERGENCE ASSY N13
POWER SUPPLY ASSY E4
STK392-110
STK392-110
BNP1250A
CMK-P3X
D18 RED
D19 GREEN
D20 BLUE
+5V
-5V
V.STOP
P.D
+32V
V.RET
-25V*
GND
IC4705 IC4704
IC4701 IC4702
Q4702-Q4705
Q4501
Q4502
Q4707 Q4706 Q4701
Q4513
IC4703
Q4514
IC4502
Q4517
IC4501
Q4509 Q4503
Q4516 Q4504
Q4515
Q4511
CONVERGENCE ASSY N10
D.Y
CONVERGENCE ASSY N11
D.Y
D.Y
CONVERGENCE ASSY N8
CONVERGENCE ASSY N3
H.V & DEFLECTION ASSY C5

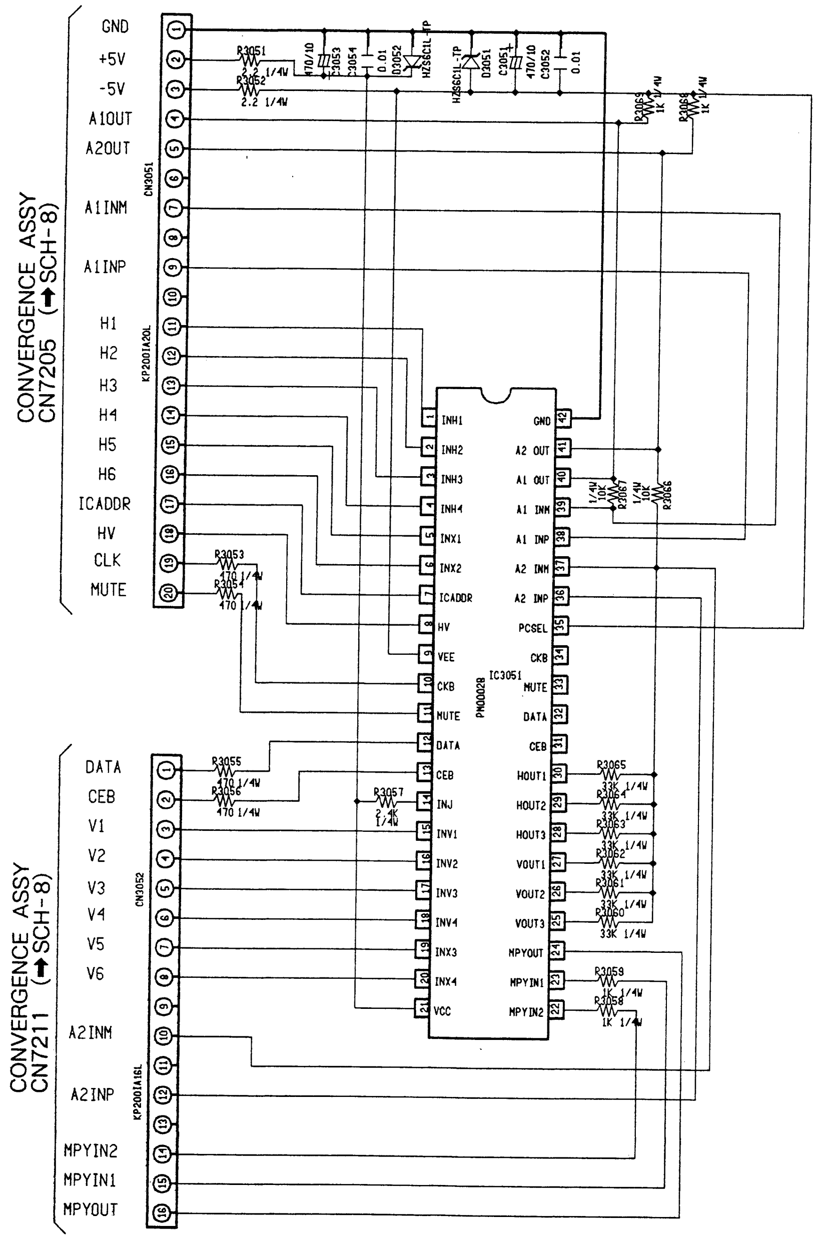
- This diagram is viewed from the mounted parts side.

5.11 CONV. MODULE (RH), (RV), (GH)

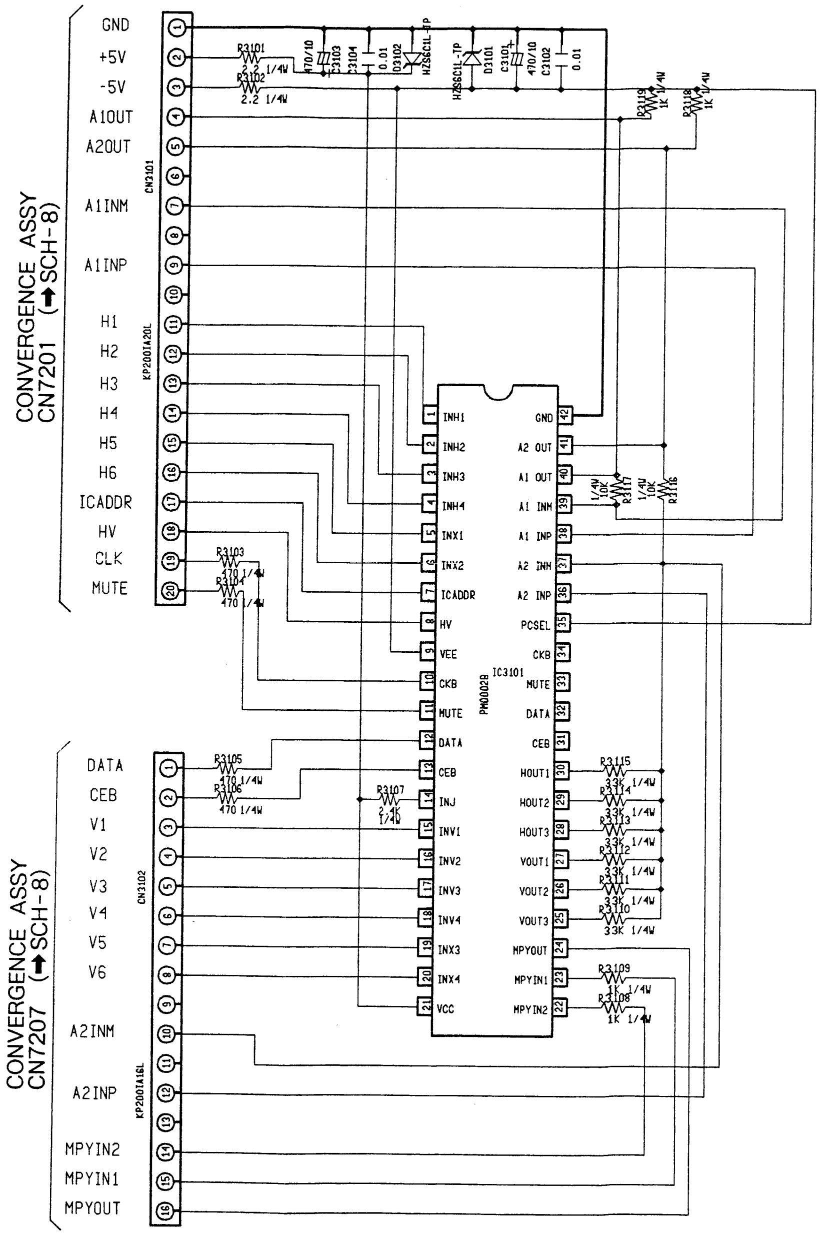
CONV. MODULE (RH)
(BWZ1644)


CONVERGENCE ASSY CN7202 (⬆SCH-8)
CN3001
KP200IA20L
GND
+5V
-5V
A1OUT
A2OUT
A1INM
A1INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
R3001 2.2 1/4W
R3002 2.2 1/4W
470/10 C3003
C3004 0.01
D3002
HZS6C1L-TP
D3001
C3001 470/10
C3002 0.01
R3018 1K 1/4W
R3019 1K 1/4W
R3003 470 1/4W
R3004 470 1/4W
R3017 1/4W 10K
R3016 1/4W 10K
IC3001
PM0002B
INH1
INH2
INH3
INH4
INX1
INX2
ICADDR
HV
VEE
CKB
MUTE
DATA
CEB
INJ
INV1
INV2
INV3
INV4
INX3
INX4
VCC
GND
A2 OUT
A1 OUT
A1 INM
A1 INP
A2 INM
A2 INP
PCSEL
CKB
MUTE
DATA
CEB
HOUT1
HOUT2
HOUT3
VOUT1
VOUT2
VOUT3
MPYOUT
MPYIN1
MPYIN2
R3015 33K 1/4W
R3014 33K 1/4W
R3013 33K 1/4W
R3012 33K 1/4W
R3011 33K 1/4W
R3010 33.0K 1/4W
R3009 1K 1/4W
R3008 1K 1/4W
R3005 470 1/4W
R3006 470 1/4W
R3007 2.4K 1/4W
CONVERGENCE ASSY CN7208 (⬆SCH-8)
CN3002
KP200IA16L
DATA
CEB
V1
V2
V3
V4
V5
V6
A2INM
A2INP
MPYIN2
MPYIN1
MPYOUT

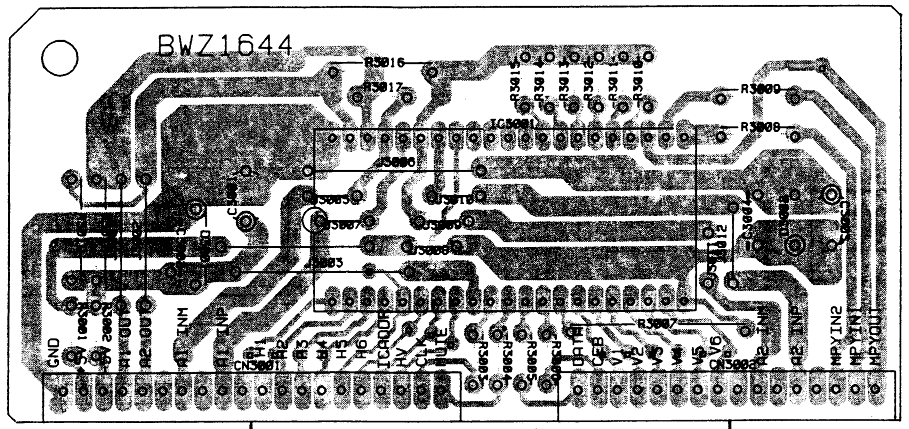
CONV. MODULE (RV)
(BWZ1645)


CONVERGENCE ASSY CN7205 (⬆SCH-8)
CN3051
KP200IA20L
GND
+5V
-5V
A1OUT
A2OUT
A1INM
A1INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
R3051 2.2 1/4W
R3052 2.2 1/4W
470/10 C3053
C3054 0.01
D3052
HZS6C1L-TP
D3051
C3051 470/10
C3052 0.01
R3069 1K 1/4W
R3068 1K 1/4W
R3053 470 1/4W
R3054 470 1/4W
R3067 1/4W 10K
R3066 1/4W 10K
IC3051
PM0002B
R3065 33K 1/4W
R3064 33K 1/4W
R3063 33K 1/4W
R3062 33K 1/4W
R3061 33K 1/4W
R3060 33K 1/4W
R3059 1K 1/4W
R3058 1K 1/4W
R3055 470 1/4W
R3056 470 1/4W
R3057 2.4K 1/4W
CONVERGENCE ASSY CN7211 (⬆SCH-8)
CN3052
KP200IA16L
DATA
CEB
V1
V2
V3
V4
V5
V6
A2INM
A2INP
MPYIN2
MPYIN1
MPYOUT

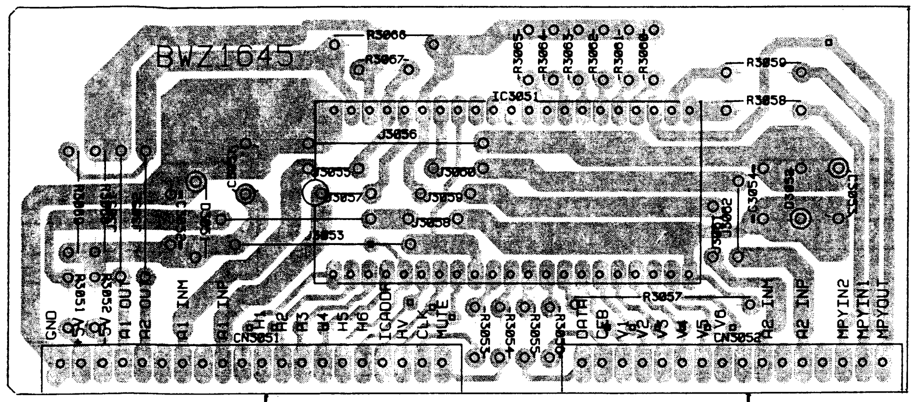
CONV. MODULE (GH)
(BWZ1646)


CONVERGENCE ASSY CN7201 (⬆SCH-8)
CN3101
KP200IA20L
GND
+5V
-5V
A1OUT
A2OUT
A1INM
A1INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
R3101 2.2 1/4W
R3102 2.2 1/4W
470/10 C3103
C3104 0.01
D3102
HZS6C1L-TP
D3101
C3101 470/10
C3102 0.01
R3119 1K 1/4W
R3118 1K 1/4W
R3103 470 1/4W
R3104 470 1/4W
R3117 1/4W 10K
R3116 1/4W 10K
IC3101
PM0002B
R3115 33K 1/4W
R3114 33K 1/4W
R3113 33K 1/4W
R3112 33K 1/4W
R3111 33K 1/4W
R3110 33K 1/4W
R3109 1K 1/4W
R3108 1K 1/4W
R3105 470 1/4W
R3106 470 1/4W
R3107 2.4K 1/4W
CONVERGENCE ASSY CN7207 (⬆SCH-8)
CN3102
KP200IA16L
DATA
CEB
V1
V2
V3
V4
V5
V6
A2INM
A2INP
MPYIN2
MPYIN1
MPYOUT

CONV. MODULE (RH)

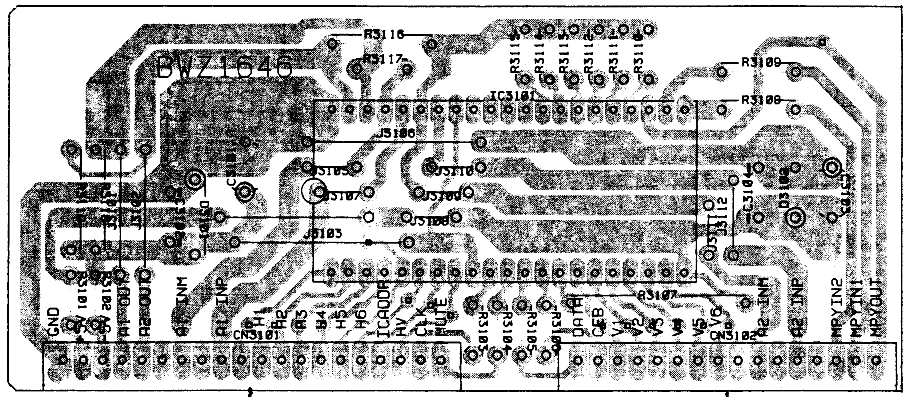

BWZ1644
IC3001
CN3001
CN3002
GND
A1 OUT
A2 OUT
A1 INM
A1 INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
DATA
CEB
V1
V2
V3
V4
V5
V6
A2 INM
A2 INP
MPYIN2
MPYIN1
MPYOUT

CONV. MODULE (RV)

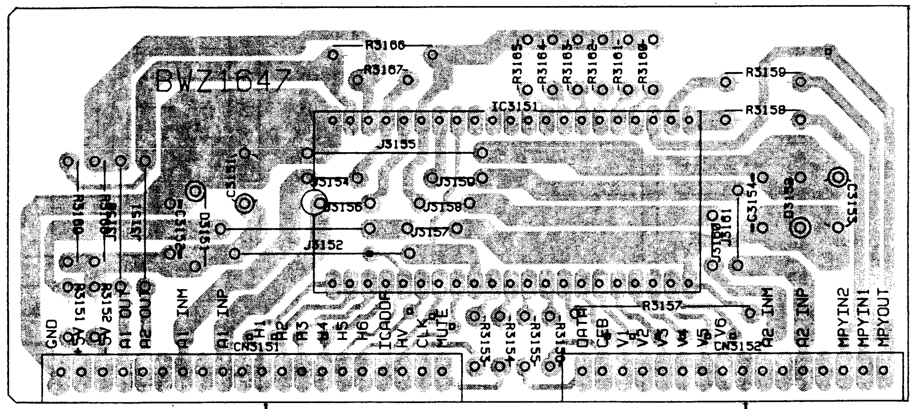

BWZ1645
IC3051
CN3051
CN3052
GND
A1 OUT
A2 OUT
A1 INM
A1 INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
DATA
CEB
V1
V2
V3
V4
V5
V6
A2 INM
A2 INP
MPYIN2
MPYIN1
MPYOUT

CONVERGENCE ASSY

CONV MODULE (G H)

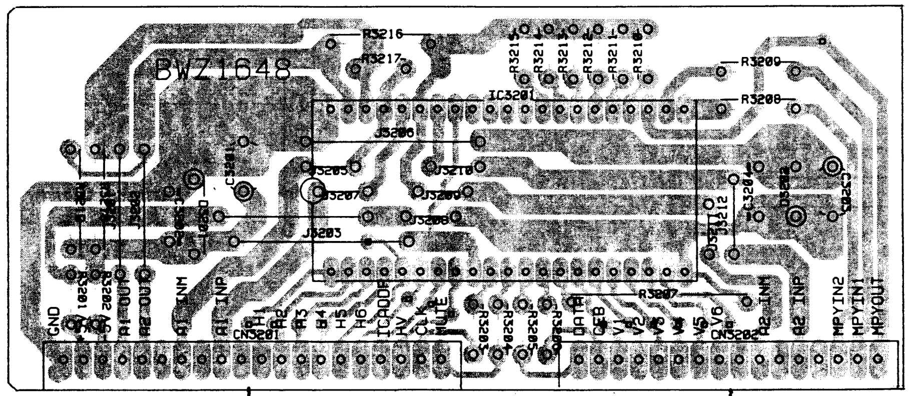

BWZ1646
IC3101
CN3101
CN3102
GND
A1 OUT
A2 OUT
A1 INM
A1 INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
DATA
CEB
V1
V2
V3
V4
V5
V6
A2 INM
A2 INP
MPYIN2
MPYIN1
MPYOUT

CONV. MODULE (GV)

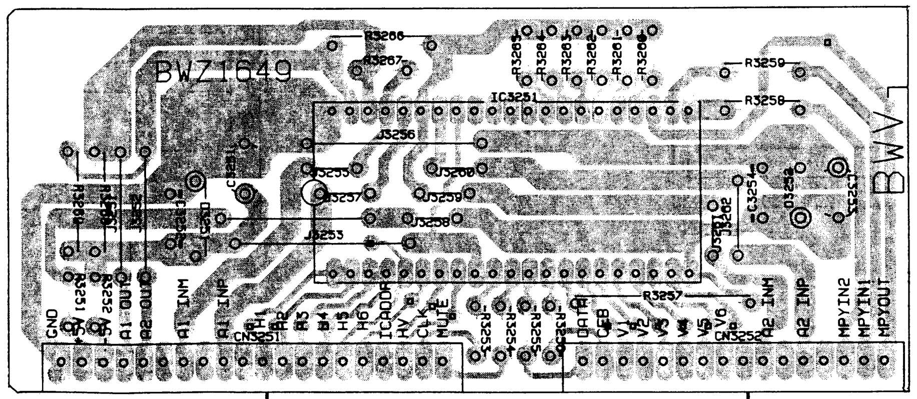

BWZ1647
IC3151
CN3151
CN3152
GND
A1 OUT
A2 OUT
A1 INM
A1 INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
DATA
CEB
V1
V2
V3
V4
V5
V6
A2 INM
A2 INP
MPYIN2
MPYIN1
MPYOUT

CONVERGENCE ASSY

CONV. MODULE (BH)


BWZ1648
IC3201
CN3201
CN3202
GND
A1 OUT
A2 OUT
A1 INM
A1 INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
DATA
CEB
V1
V2
V3
V4
V5
V6
A2 INM
A2 INP
MPYIN2
MPYIN1
MPYOUT

CONV. MODULE (BV)


BWZ1649
IC3251
CN3251
CN3252
GND
A1 OUT
A2 OUT
A1 INM
A1 INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
DATA
CEB
V1
V2
V3
V4
V5
V6
A2 INM
A2 INP
MPYIN2
MPYIN1
MPYOUT

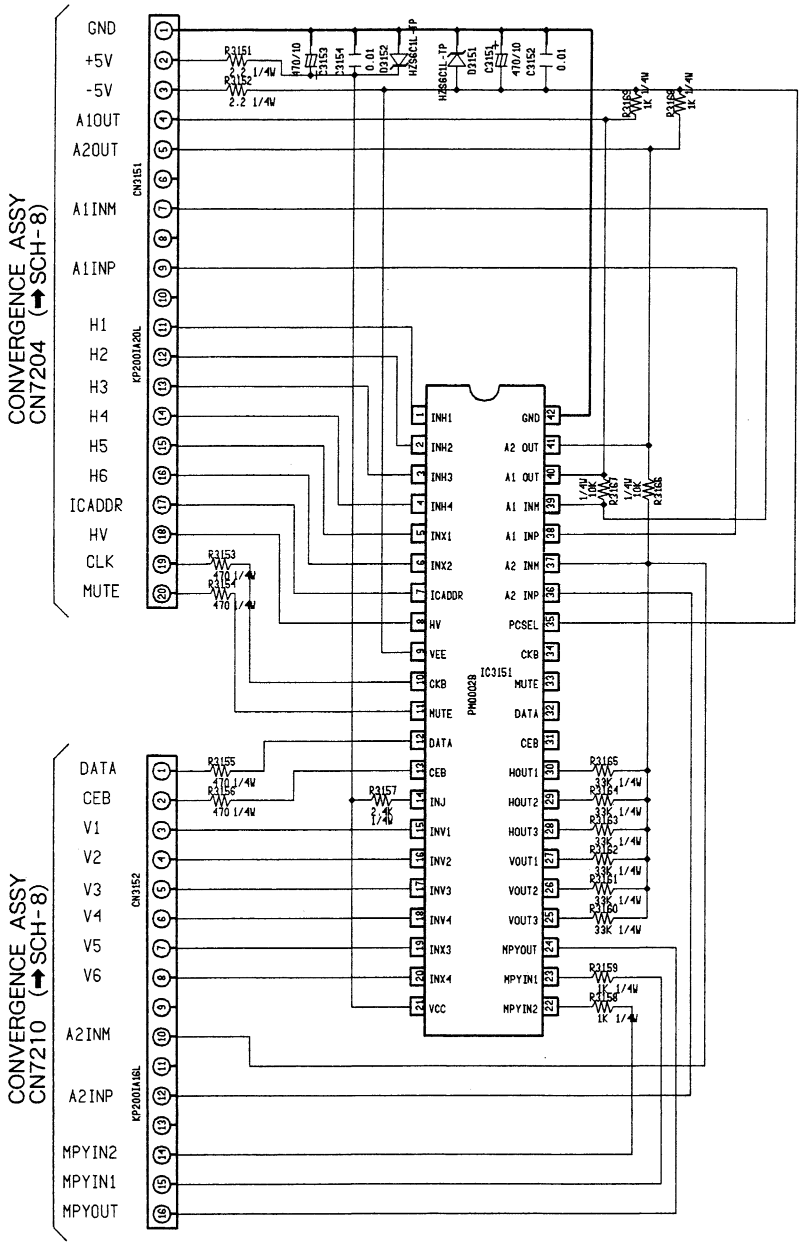
CONVERGENCE ASSY

(BNP1249 - A)

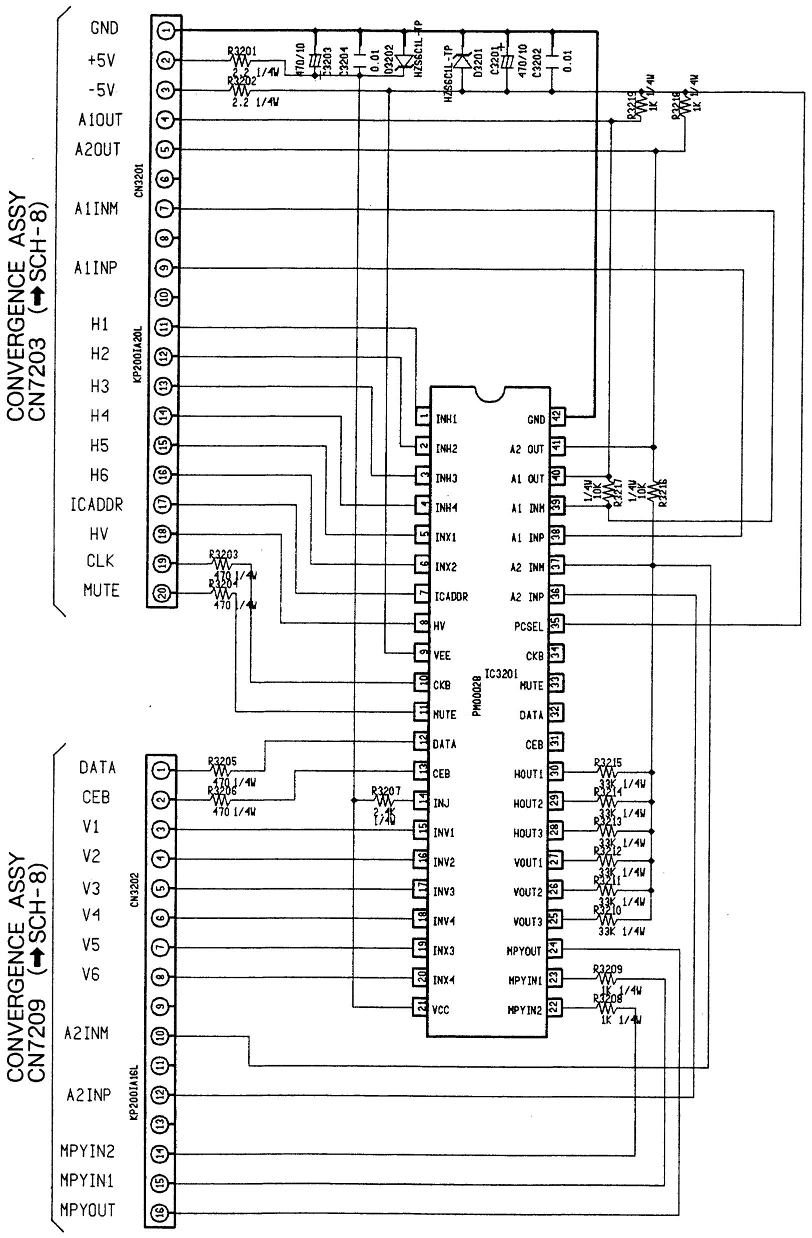
- This diagram is viewed from the mounted parts side.

5.12 CONV. MODULE (GV), (BH), (BV)

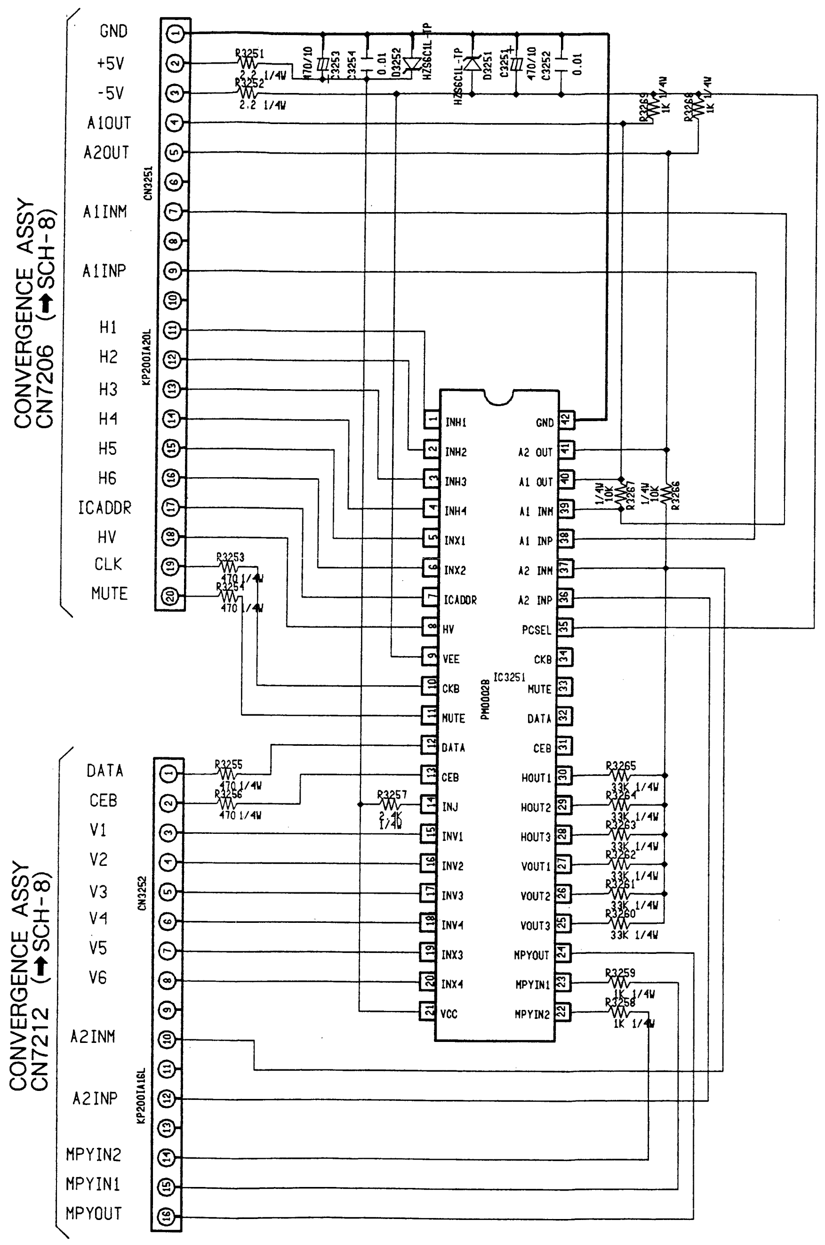
CONV. MODULE (GV)
(BWZ1647)


CONVERGENCE ASSY CN7204 (⬆SCH-8)
CN3151
KP200IA20L
GND
+5V
-5V
A1OUT
A2OUT
A1INM
A1INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
R3151 2.2 1/4W
R3152 2.2 1/4W
C3153
C3154
D3152
D3151
C3152
HZS6C1L-TP
IC3151
PM0028
R3153 470 1/4W
R3154 470 1/4W
INH1
INH2
INH3
INH4
INX1
INX2
ICADDR
HV
VEE
CKB
MUTE
DATA
CEB
INJ
INV1
INV2
INV3
INV4
INX3
INX4
VCC
GND
A2 OUT
A1 OUT
A1 INM
A1 INP
A2 INM
A2 INP
PCSEL
CKB
MUTE
DATA
CEB
HOUT1
HOUT2
HOUT3
VOUT1
VOUT2
VOUT3
MPYOUT
MPYIN1
MPYIN2
R3155 470 1/4W
R3156 470 1/4W
R3157 2.2K 1/4W
R3165 33K 1/4W
R3159 1K 1/4W
R3158 1K 1/4W
CONVERGENCE ASSY CN7210 (⬆SCH-8)
CN3152
KP200IA16L
DATA
CEB
V1
V2
V3
V4
V5
V6
A2INM
A2INP
MPYIN2
MPYIN1
MPYOUT

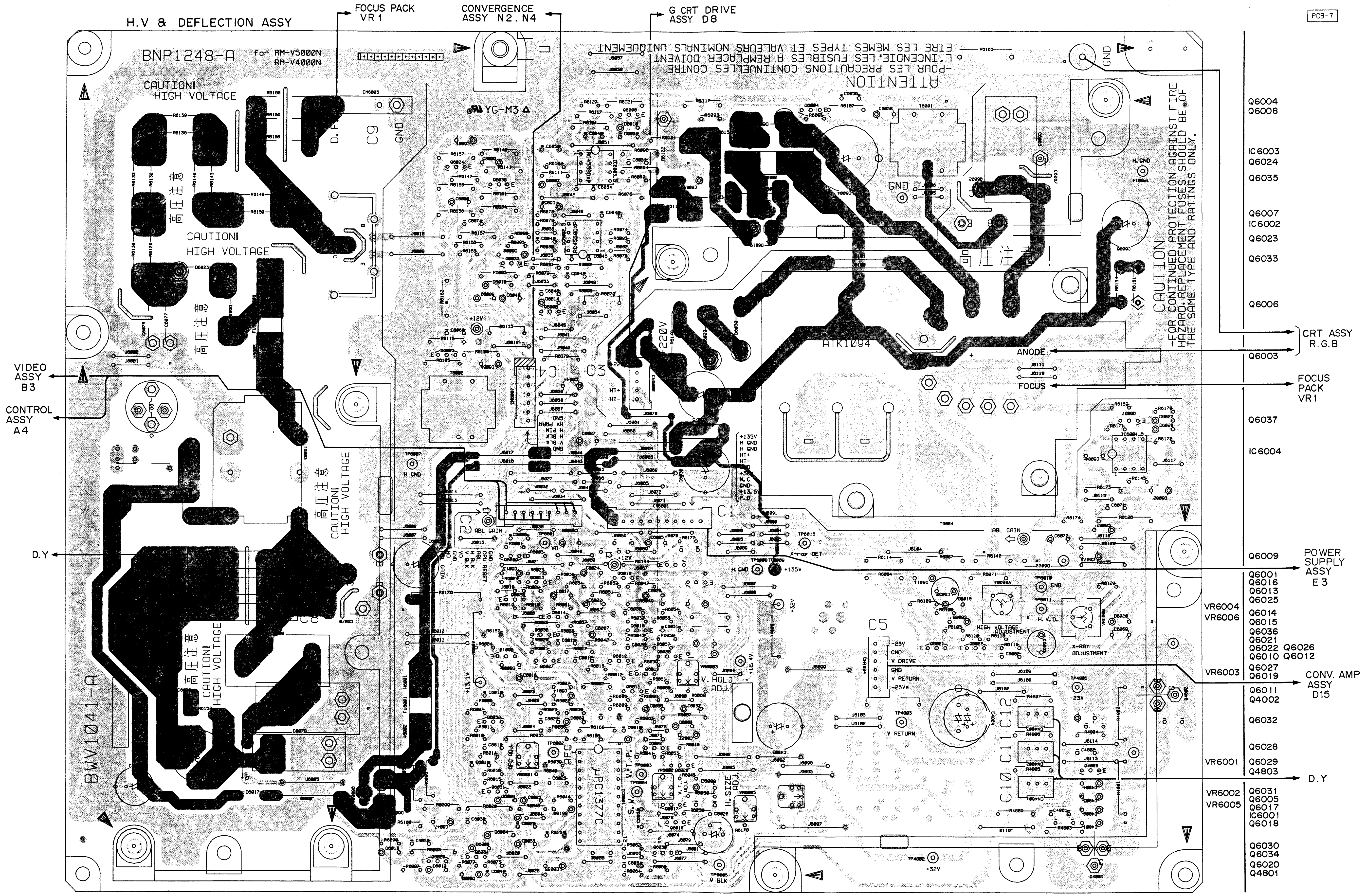
CONV. MODULE (BH)
(BWZ1648)


CONVERGENCE ASSY CN7203 (⬆SCH-8)
CN3201
KP200IA20L
GND
+5V
-5V
A1OUT
A2OUT
A1INM
A1INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
R3201 2.2 1/4W
R3202 2.2 1/4W
C3203
C3204
D3202
D3201
C3202
HZS6C1L-TP
IC3201
PM0028
R3203 470 1/4W
R3204 470 1/4W
R3205 470 1/4W
R3206 470 1/4W
R3207 2.2K 1/4W
R3215 33K 1/4W
R3209 1K 1/4W
R3208 1K 1/4W
CONVERGENCE ASSY CN7209 (⬆SCH-8)
CN3202
KP200IA16L
DATA
CEB
V1
V2
V3
V4
V5
V6
A2INM
A2INP
MPYIN2
MPYIN1
MPYOUT

CONV. MODULE (BV)
(BWZ1649)

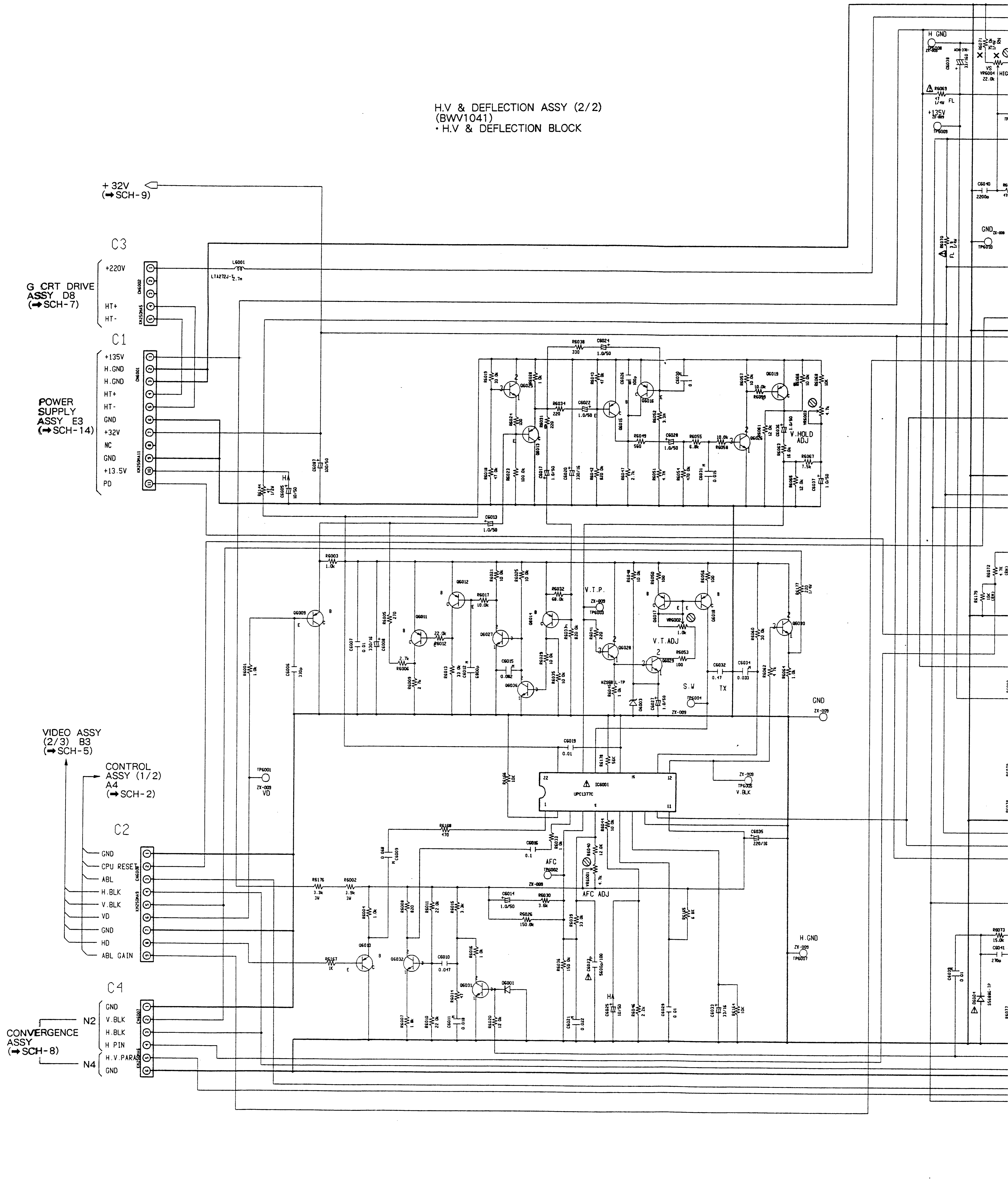

CONVERGENCE ASSY CN7206 (⬆SCH-8)
CN3251
KP200IA20L
GND
+5V
-5V
A1OUT
A2OUT
A1INM
A1INP
H1
H2
H3
H4
H5
H6
ICADDR
HV
CLK
MUTE
R3251 2.2 1/4W
R3252 2.2 1/4W
C3253
C3254
D3252
D3251
C3252
HZS6C1L-TP
IC3251
PM0028
R3253 470 1/4W
R3254 470 1/4W
R3255 470 1/4W
R3256 470 1/4W
R3257 2.2K 1/4W
R3265 33K 1/4W
R3259 1K 1/4W
R3258 1K 1/4W
CONVERGENCE ASSY CN7212 (⬆SCH-8)
CN3252
KP200IA16L
DATA
CEB
V1
V2
V3
V4
V5
V6
A2INM
A2INP
MPYIN2
MPYIN1
MPYOUT

5.13 H.V & DEFLECTION ASSY (2/2)

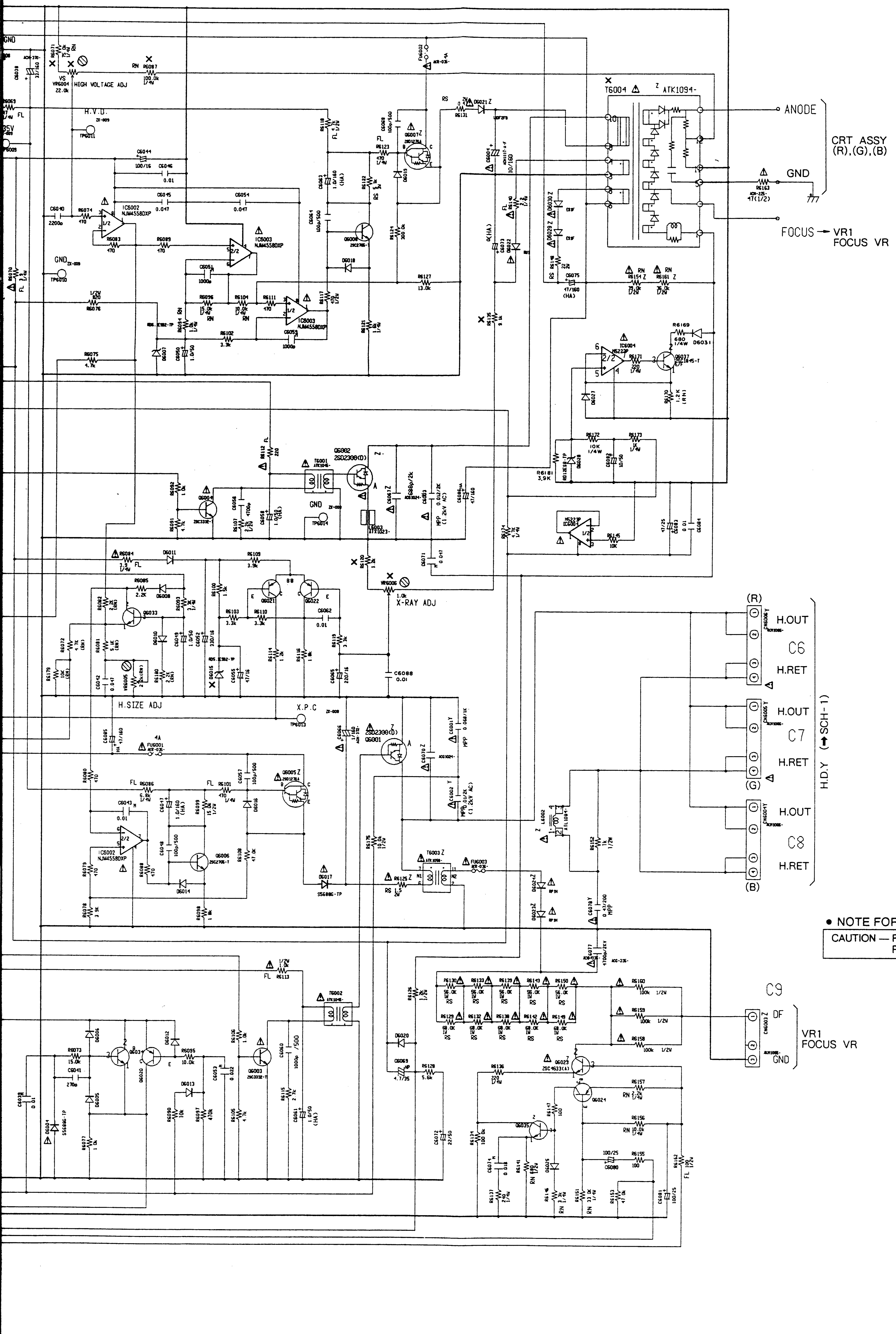

PCB-7
H.V & DEFLECTION ASSY
FOCUS PACK VR1
CONVERGENCE ASSY N2.N4
G CRT DRIVE ASSY D8
BNP1248-A
for RM-V5000N RM-V4000N
CAUTION! HIGH VOLTAGE
高圧注意
YG-M3
GND
ATTENTION
-POUR LES PRECAUTIONS CONTINUELLES CONTRE L'INCENDIE, LES FUSIBLES A REMPLACER DOIVENT ETRE LES MEMES TYPES ET VALEURS NOMINALS UNIQUEMENT
CAUTION
-FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACEMENT FUSES SHOULD BE OF THE SAME TYPE AND RATINGS ONLY.
H.GND
220V
ATK1094
ANODE
FOCUS
C1
C2
C3
C4
C5
C9
C10 C11 C12
+135V
H GND
H GND
HT+
HT-
+12V
+32V
-23V
V DRIVE
V RETURN
ABL GAIN
X-ray DET
HIGH VOLTAGE ADJUSTMENT
X-RAY ADJUSTMENT
H.V.D.
V. HOLD ADJ.
H. SIZE ADJ.
S. W.
V. LIN. ADJ.
V. BLK
µPC1377C
AFC
BWV1041-A
IC6004
VIDEO ASSY B3
CONTROL ASSY A4
D.Y
CRT ASSY R.G.B
FOCUS PACK VR1
POWER SUPPLY ASSY E3
CONV. AMP ASSY D15
D.Y
Q6004
Q6008
IC6003
Q6024
Q6035
Q6007
IC6002
Q6023
Q6033
Q6006
Q6003
Q6037
IC6004
Q6009
Q6001
Q6016
Q6013
Q6025
VR6004
VR6006
Q6014
Q6015
Q6036
Q6021
Q6022 Q6026
Q6010 Q6012
Q6027
VR6003
Q6019
Q6011
Q4002
Q6032
Q6028
VR6001
Q6029
Q4803
VR6002
VR6005
Q6031
Q6005
Q6017
IC6001
Q6018
Q6030
Q6034
Q6020
Q4801

- This diagram is viewed from the mounted parts side.

▆ mark shows a high voltage generation point (excepting the charged section).


H.V & DEFLECTION ASSY (2/2)
(BWV1041)
• H.V & DEFLECTION BLOCK
+32V
(➡SCH-9)
C3
+220V
HT+
HT-
G CRT DRIVE
ASSY D8
(➡SCH-7)
L6001
LTA272J-T
C1
+135V
H.GND
H.GND
HT+
HT-
GND
+32V
NC
GND
+13.5V
PD
POWER
SUPPLY
ASSY E3
(➡SCH-14)
V.HOLD
ADJ
V.T.P.
V.T.ADJ
S.W
TX
GND
VIDEO ASSY
(2/3) B3
(➡SCH-5)
CONTROL
ASSY (1/2)
A4
(➡SCH-2)
TP6001
VD
IC6001
UPC1377C
V.BLK
C2
GND
CPU RESET
ABL
H.BLK
V.BLK
VD
GND
HD
ABL GAIN
AFC
AFC ADJ
H.GND
C4
GND
V.BLK
H.BLK
H PIN
H.V.PARA
GND
N2
N4
CONVERGENCE
ASSY
(➡SCH-8)
H GND
+135V
GND
HA

SCH-13 H.V & DEFLECTION ASSY (2/2)


HIGH VOLTAGE ADJ
H.V.D.
IC6002 NJM4558DXP
IC6003 NJM4558DXP
T6004
ATK1094-
ANODE
CRT ASSY
(R),(G),(B)
GND
FOCUS → VR1
FOCUS VR
Q6002 2SD2398(D)
T6001
T6003
X-RAY ADJ
H.SIZE ADJ
X.P.C
Q6001 2SD2398(D)
(R)
H.OUT
C6
H.RET
H.OUT
C7
H.RET
(G)
H.OUT
C8
H.RET
(B)
H.D.Y (→SCH-1)
T6002
C9
DF
GND
VR1
FOCUS VR

DIODE D6026 COMP HSS104-02

RESISTORS
RS ; METAL OXIDE FILM RESISTOR
RN ; METAL FILM RESISTOR
FL ; NONFLAMMBLE RESISTOR

CAPACITORS
HA ; ELECTROLYTIC CAPACITOR (TEMP ~105 C)
NP ; NONPOLAR ELECTROYTIC CAPACITOR
MPP ; METALIZED POLYPROPYTENT CAPACITOR
TX ; AUDIO FILM CAPACITOR
M ; MYLOR FILM CAPACITOR

NOTE

1 RESISTORS
INDICATED IN ;1/4W,1/8W 5% TOLERANCE
UNLESS OTHERWISE NOTED k;kΩ;M Ω

2 CAPACITORS
INDICATED IN CAPACITY(uF)/VOLTAGE(V) UNLESS
OTHERWISE NOTED p :pF INDICATION WITHOUT VOLTAGE
IS 50V EXCEPT ELECTROLYTIC CAPACITOR

3 OTHERS
⊘ ;ADJUSTING POINT
THE ⚠MARK FOUND ON SOME COMPONENT PARTS
INDICATES THE IMPORTANCE OF THE SAFETY
FACTOR OF THE PARTS.THEREFORE,WHEN REPLACING,
BE SURE TO USE PARTS OF IDENTICAL DESIGNATION.

- **NOTE FOR FUSE REPLACEMENT**

CAUTION — FOR CONTINUED PROTECTION AGAINST RISK OF FIRE.
REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.

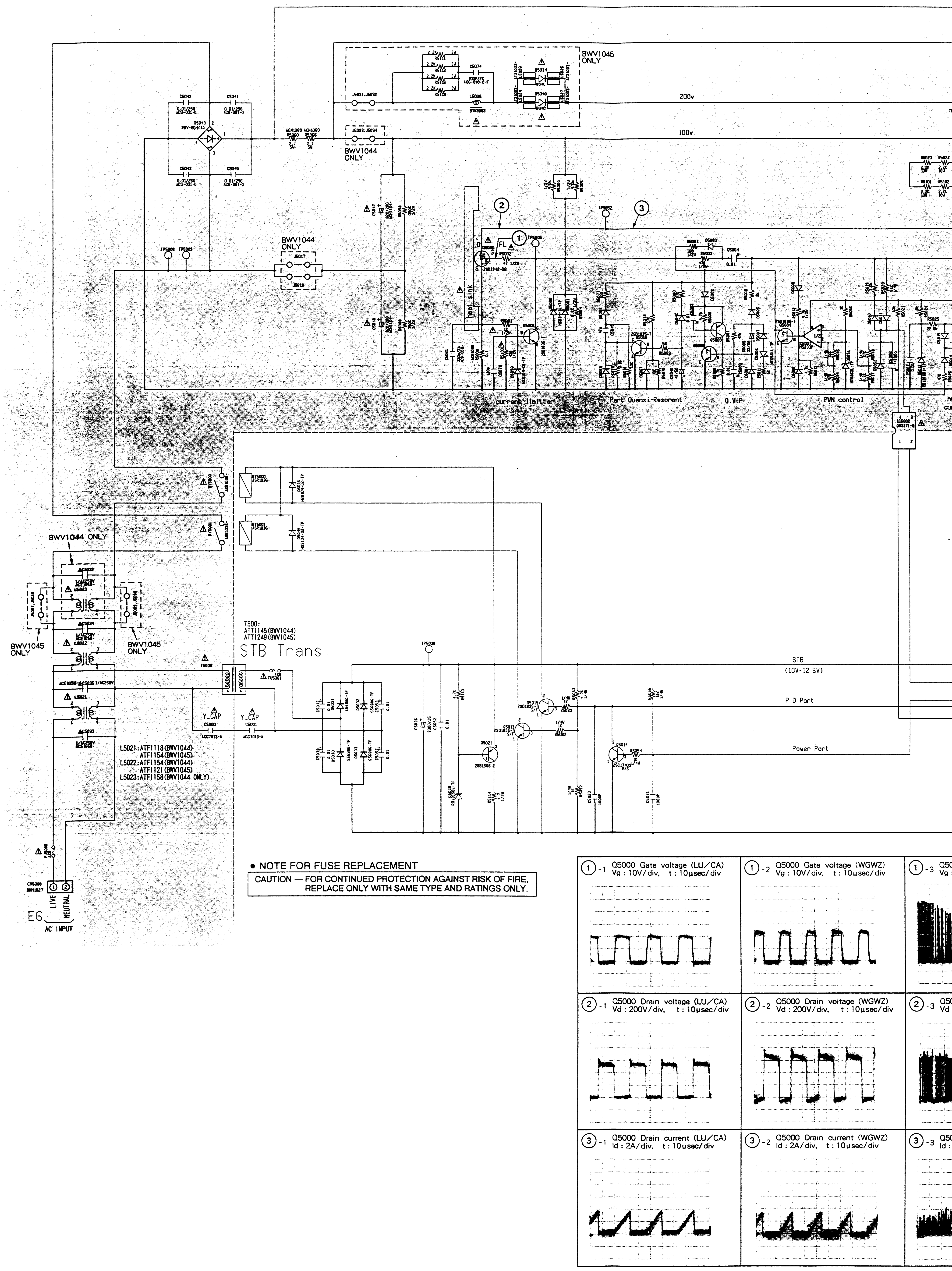
H.V & DEFLECTION
ASSY (2/2)

SCH-13

5.14 POWER SUPPLY ASSY

POWER SUPPLY ASSY
(BWV1044) : LU/CA
(BWV1045) : WGWZ

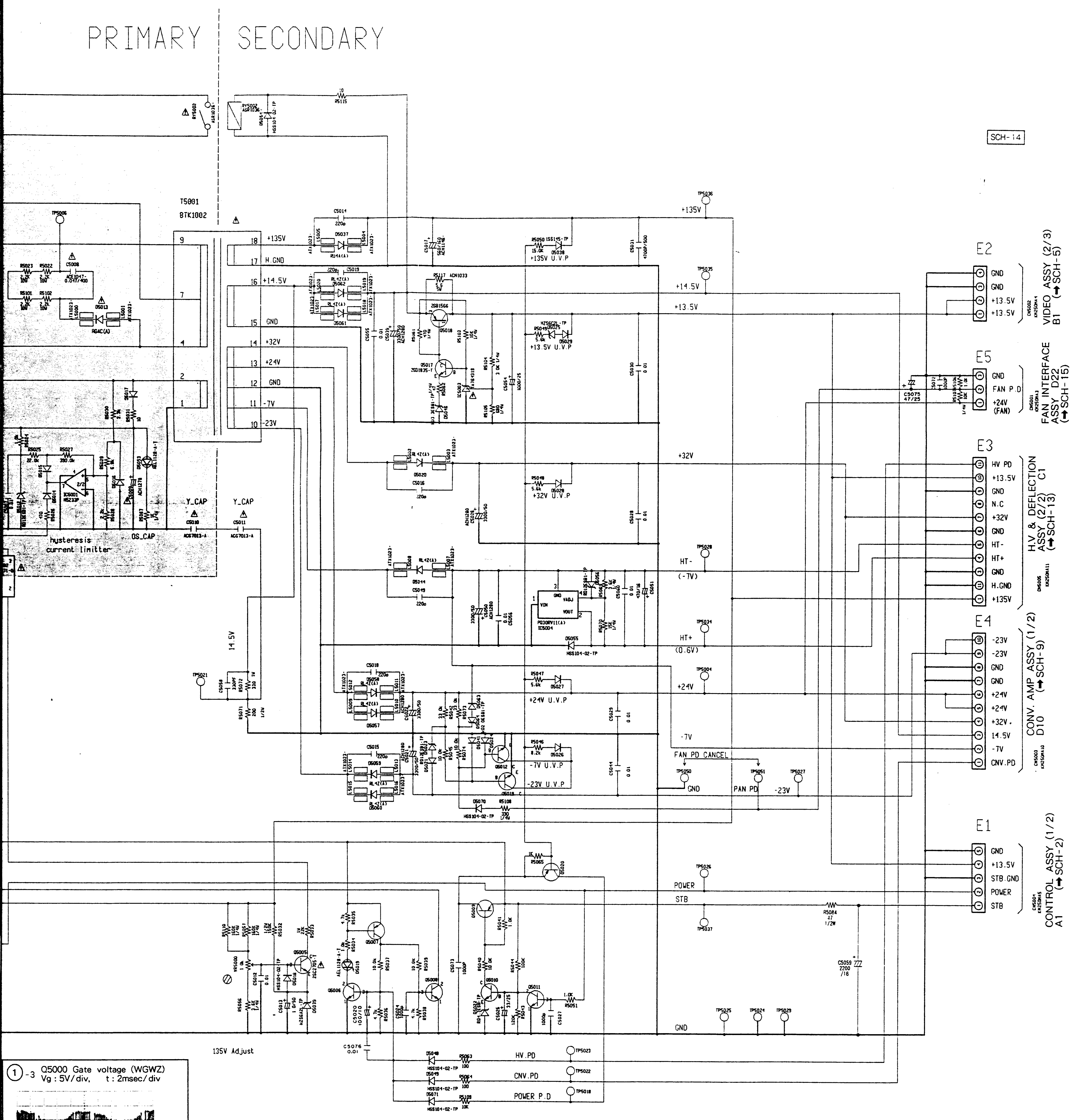
: CHARGED SECTION



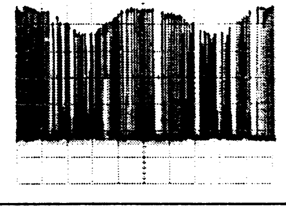
BWV1045 ONLY
BWV1044 ONLY
200v
100v
C5042 0.01/250
C5041 0.01/250
D5043 RBV-601(A)
C5043 0.01/250
C5040 0.01/250
TP5008 TP5009
J5017
J5018
L5006
ATH1060 R5060 ACH1060 R5066
J5091, J5092
J5093, J5094
Q5000 2SK1342-06
D
G
S
FL
R5002
TP5005
TP5052
Q5001 2SD1835-T
heat sink
current limitter
Part Quensi-Resonent
O.V.P
PWM control
IC5002
Q5005 2SD1835-T
RY5000 ASR1036-
RY5001 ASR1036-
D5035
D5015
BWV1044 ONLY
L5023
L5022
L5021
C5032
C5033
C5034
C5035 1/AC250V
T5000
T500:
ATT1145(BWV1044)
ATT1249(BWV1045)
STB Trans.
FU5001
Y_CAP C5000 ACG7013-A
Y_CAP C5001 ACG7013-A
L5021:ATF1118(BWV1044)
ATF1154(BWV1045)
L5022:ATF1154(BWV1044)
ATF1121(BWV1045)
L5023:ATF1158(BWV1044 ONLY)
TP5038
Q5021 2SB1566
Q5012 2SD1835
Q5013 2SD1835
Q5014
STB (10V-12.5V)
P.D Port
Power Port
FU5000
CN5000
LIVE
NEUTRAL
E6
AC INPUT
①-1 Q5000 Gate voltage (LU/CA) Vg : 10V/div, t : 10μsec/div
①-2 Q5000 Gate voltage (WGWZ) Vg : 10V/div, t : 10μsec/div
①-3 Q50
②-1 Q5000 Drain voltage (LU/CA) Vd : 200V/div, t : 10μsec/div
②-2 Q5000 Drain voltage (WGWZ) Vd : 200V/div, t : 10μsec/div
②-3 Q50
③-1 Q5000 Drain current (LU/CA) Id : 2A/div, t : 10μsec/div
③-2 Q5000 Drain current (WGWZ) Id : 2A/div, t : 10μsec/div
③-3 Q50
A
B
C
D
E
F
1
2
3
4

- NOTE FOR FUSE REPLACEMENT

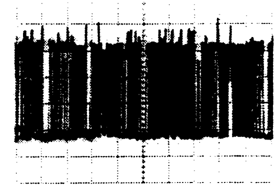
CAUTION — FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.


PRIMARY
SECONDARY
SCH-14
T5001
BTK1002
RY5002
RY5001
+135V
H.GND
+14.5V
GND
+32V
+24V
GND
-7V
-23V
TP5006
TP5036
TP5035
+135V
+14.5V
+13.5V
2SB1566
Q5018
2SD1875
Q5017
+135V U.V.P
+13.5V U.V.P
+32V U.V.P
+24V U.V.P
-7V U.V.P
-23V U.V.P
IC5004
PQ30RV11(A)
VIN
VOUT
GND
VADJ
HT-
(-7V)
HT+
(0.6V)
+24V
-7V
FAN PD CANCEL
GND
PAN PD
-23V
TP5028
TP5034
TP5004
TP5050
TP5051
TP5027
TP5021
14.5V
hysteresis current limitter
Y_CAP
OS_CAP
IC5001
POWER
STB
TP5026
TP5037
R5084
GND
TP5025
TP5024
TP5029
135V Adjust
HV.PD
CNV.PD
POWER P.D
TP5023
TP5022
TP5018
E2
GND
GND
+13.5V
+13.5V
VIDEO ASSY (2/3) B1 (→SCH-5)
E5
GND
FAN P.D
+24V (FAN)
FAN INTERFACE ASSY D22 (→SCH-15)
E3
HV PD
+13.5V
GND
N.C
+32V
GND
HT-
HT+
GND
H.GND
+135V
H.V & DEFLECTION ASSY (2/2) C1 (→SCH-13)
E4
-23V
-23V
GND
GND
+24V
+24V
+32V
14.5V
-7V
CNV.PD
CONV. AMP ASSY (1/2) D10 (→SCH-9)
E1
GND
+13.5V
STB.GND
POWER
STB
CONTROL ASSY (1/2) A1 (→SCH-2)

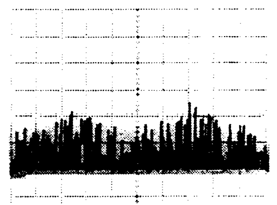
①-3 Q5000 Gate voltage (WGWZ)
Vg : 5V/div, t : 2msec/div

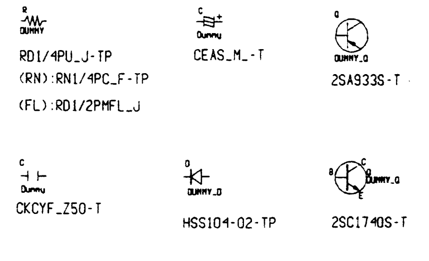


②-3 Q5000 Drain voltage (WGWZ)
Vd : 200V/div, t : 2msec/div



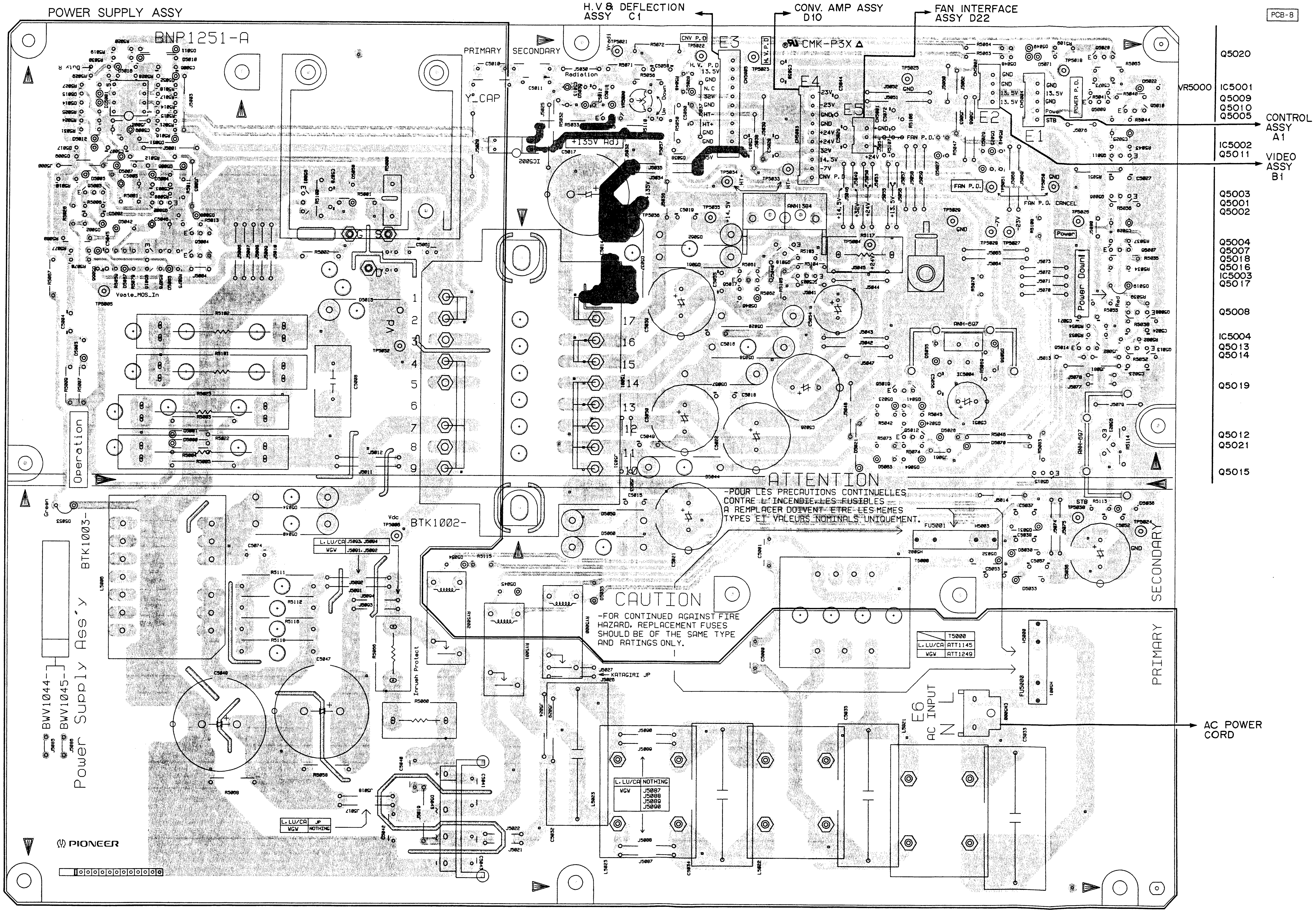
③-3 Q5000 Drain current (WGWZ)
Id : 2A/div, t : 2msec/div





POWER SUPPLY ASSY **SCH-14**

POWER SUPPLY ASSY

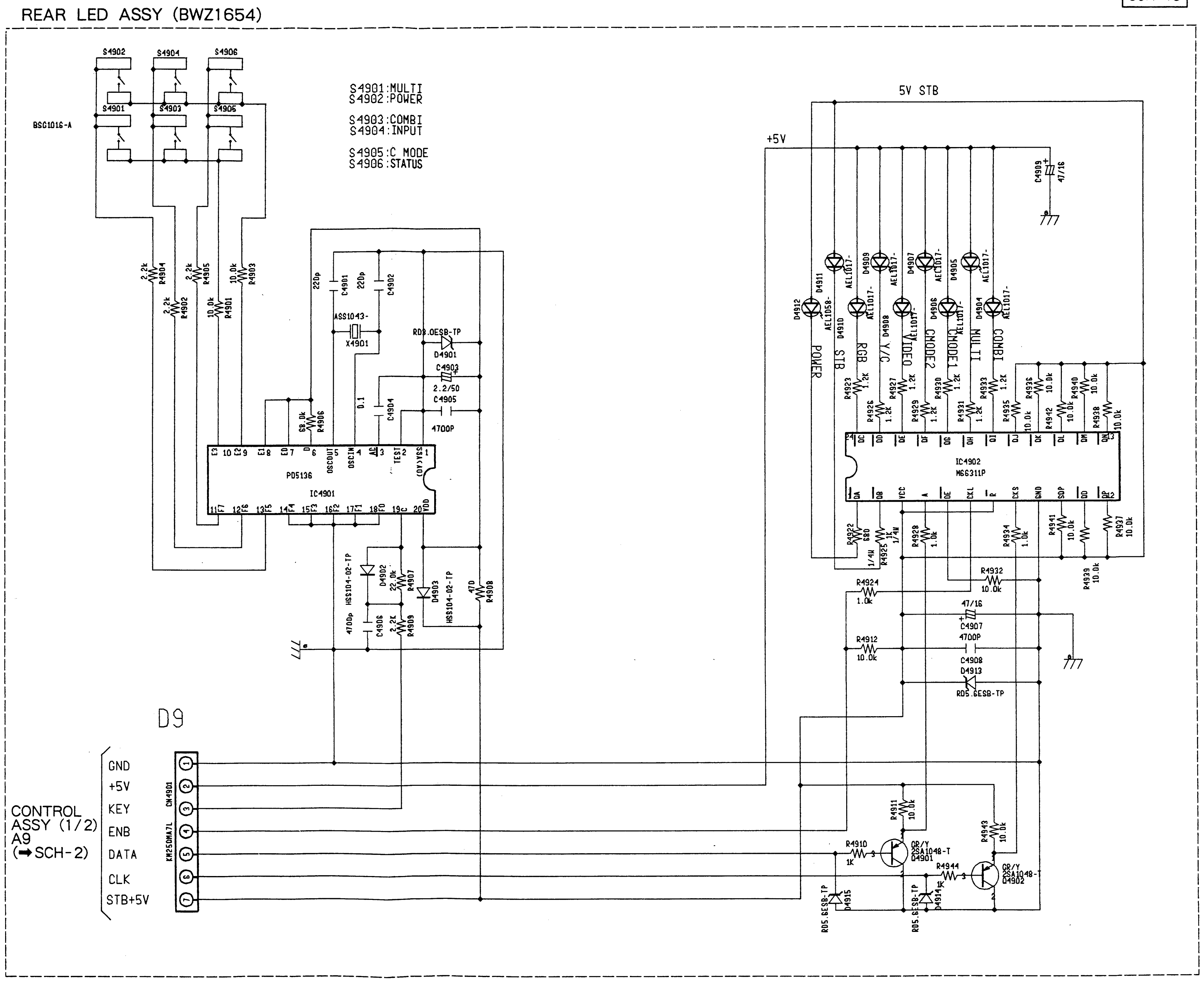

H.V & DEFLECTION ASSY C1
CONV. AMP ASSY D10
FAN INTERFACE ASSY D22
BNP1251-A
PRIMARY
SECONDARY
Y_CAP
+135V Adj
CMK-P3X
E1
E2
E3
E4
E5
E6
AC INPUT
Q5020
VR5000
IC5001
Q5009
Q5010
Q5005
CONTROL ASSY A1
IC5002
Q5011
VIDEO ASSY B1
Q5003
Q5001
Q5002
Q5004
Q5007
Q5018
Q5016
IC5003
Q5017
Q5008
IC5004
Q5013
Q5014
Q5019
Q5012
Q5021
Q5015
AC POWER CORD
ANH1304
ANH-607
FAN P.D.
Power Down
Operation
BTK1002-
BTK1003-
BWV1044-
BWV1045-
Power Supply Ass'y
Inrush Protect
KATAGIRI JP
ATTENTION
-POUR LES PRECAUTIONS CONTINUELLES CONTRE L'INCENDIE LES FUSIBLES A REMPLACER DOIVENT ETRE LES MEMES TYPES ET VALEURS NOMINALS UNIQUEMENT.
CAUTION
-FOR CONTINUED AGAINST FIRE HAZARD, REPLACEMENT FUSES SHOULD BE OF THE SAME TYPE AND RATINGS ONLY.
T5000
L.LU/CA ATT1145
WGW ATT1249
L.LU/CA NOTHING
WGW J5087 J5088 J5089 J5090
L.LU/CA JP
WGW NOTHING
PIONEER

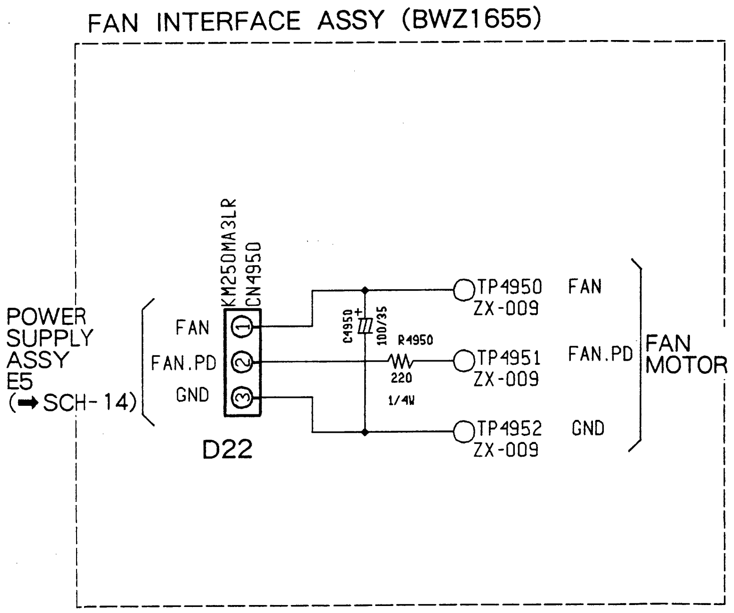
- This diagram is viewed from the mounted parts side.

▭ mark shows the charged section (Power supply primary side circuit).

▬ mark shows a high voltage generation point (excepting the charged section).

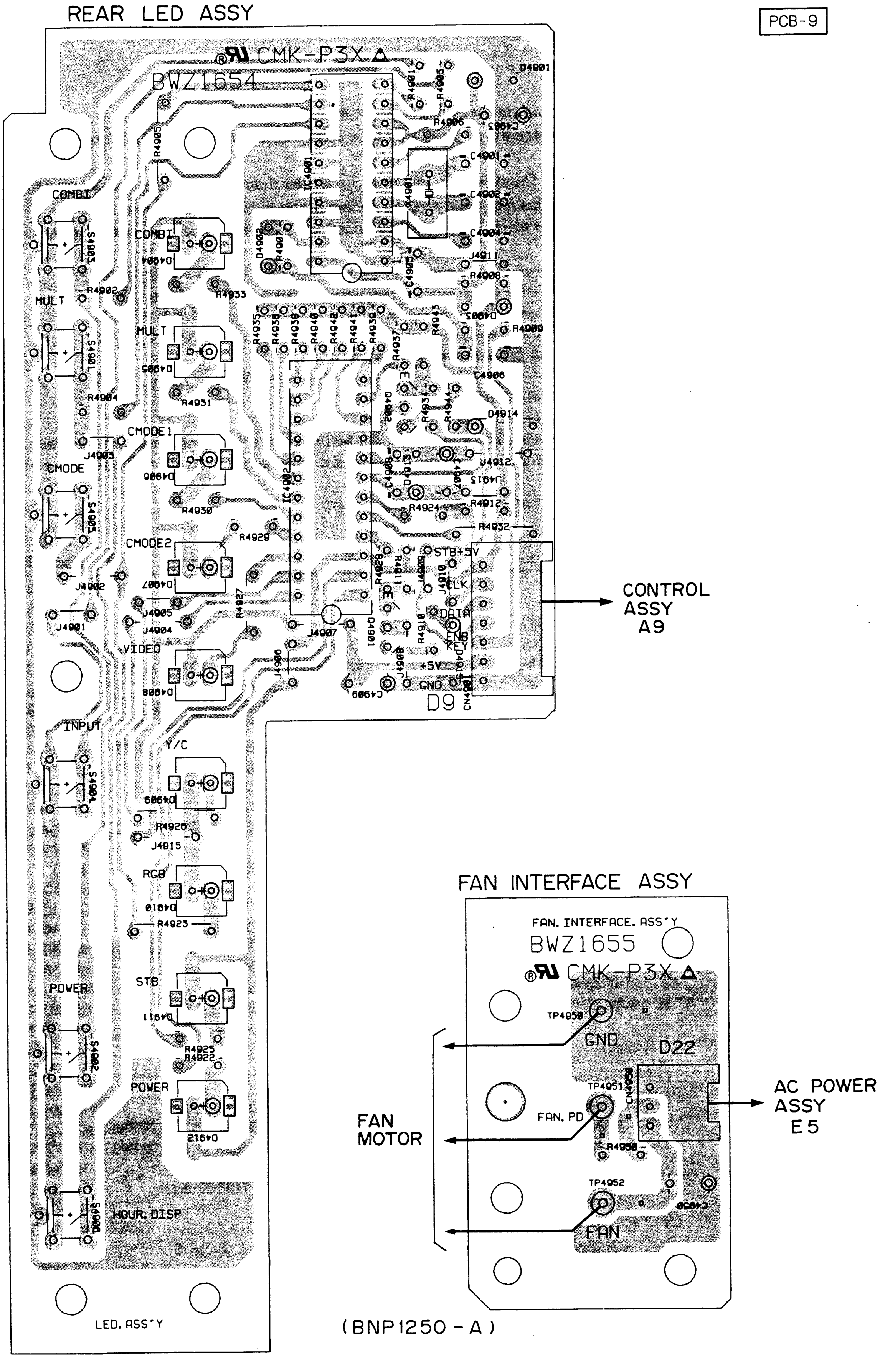
5.15 REAR LED AND FAN INTERFACE ASSEMBLIES


REAR LED ASSY (BWZ1654)
S4902
S4904
S4906
S4901
S4903
S4905
BSG1016-A
S4901:MULTI
S4902:POWER
S4903:COMBI
S4904:INPUT
S4905:C MODE
S4906:STATUS
R4904 2.2k
R4902 2.2k
R4905 2.2k
R4901 10.0k
R4903 10.0k
R4906 68.0k
C4901 220p
C4902 220p
ASS1043-
X4901
RD3.0ESB-TP
D4901
C4903 2.2/50
C4905 4700P
C4904 0.1
PD5136
IC4901
TEST
VDD
OSCOUT
OSCIN
D4902 HSS104-02-TP
D4903 HSS104-02-TP
C4906 4700p
R4907 22.0k
R4909 2.2k
R4908 470
5V STB
+5V
C4909 47/16
D4912 AEL1058-
D4911 AEL1017-
D4910
D4909
D4908
D4907
D4906
D4905
D4904
D4903
AEL1017-
POWER
STB
RGB
Y/C
VIDEO
CMODE2
CMODE1
MULTI
COMBI
R4923 1.2k
R4926 1.2k
R4927 1.2k
R4929 1.2k
R4930 1.2k
R4931 1.2k
R4933 1.2k
R4935 1.2k
R4936 10.0k
R4940 10.0k
R4942 10.0k
R4938 10.0k
IC4902
M66311P
R4922 680 1/4W
R4925 1k 1/4W
R4928 1.0k
R4934 1.0k
R4941 10.0k
R4937 10.0k
R4939 10.0k
R4924 1.0k
R4932 10.0k
C4907 47/16
R4912 10.0k
C4908 4700P
D4913 RD5.6ESB-TP
D9
GND
+5V
KEY
ENB
DATA
CLK
STB+5V
CN4901 KM250MA7L
CONTROL ASSY (1/2) A9 (➡SCH-2)
R4911 10.0k
R4910 1K
GR/Y 2SA1048-T Q4901
R4943 10.0k
R4944 1K
GR/Y 2SA1048-T Q4902
D4915 RD5.6ESB-TP
D4914 RD5.6ESB-TP


FAN INTERFACE ASSY (BWZ1655)
POWER SUPPLY ASSY E5 (➡SCH-14)
FAN
FAN.PD
GND
KM250MA3LR
CN4950
D22
C4950 100/35
R4950 220 1/4W
TP4950 ZX-009
TP4951 ZX-009
TP4952 ZX-009
FAN
FAN.PD
GND
FAN MOTOR

• This diagram is viewed from the mounted parts side.

PCB-9


REAR LED ASSY
CMK-P3X
BWZ1654
IC4901
IC4902
X4901
COMBI
MULT
CMODE
CMODE1
CMODE2
VIDEO
INPUT
Y/C
RGB
STB
POWER
HOUR. DISP
S4903
S4901
S4905
S4904
S4902
S4906
D4901
D4902
D4903
D4904
D4905
D4906
D4907
D4908
D4909
D4910
D4911
D4912
D4913
D4914
C4901
C4902
C4903
C4904
C4905
C4906
C4907
C4908
C4909
R4901
R4902
R4903
R4904
R4905
R4906
R4907
R4908
R4909
R4910
R4911
R4912
R4922
R4923
R4924
R4925
R4926
R4927
R4928
R4929
R4930
R4931
R4932
R4933
R4934
R4935
R4936
R4937
R4938
R4939
R4940
R4941
R4942
R4943
R4944
J4901
J4902
J4903
J4904
J4905
J4906
J4907
J4908
J4909
J4910
J4911
J4912
J4913
J4915
CN4901
STB+5V
CLK
DATA
ENB
KEY
+5V
GND
D9
CONTROL ASSY A9
LED. ASS'Y
FAN INTERFACE ASSY
FAN. INTERFACE. ASS'Y
BWZ1655
CMK-P3X
TP4950
GND
D22
TP4951
CN4950
FAN. PD
R4950
TP4952
C4950
FAN
FAN MOTOR
AC POWER ASSY E5

(BNP1250 - A)

6. PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohms and 47k ohms (tolerance is shown by J = 5%, and K =10%).

560 Ω → 56×10¹ → 561 ------------------------------ RD1/4PU $\boxed{5}\boxed{6}\boxed{1}$ *J*
47 kΩ → 47×10³ → 473 ------------------------------ RD1/4PS $\boxed{4}\boxed{7}\boxed{3}$ *J*
0.5 Ω → 0R5 ------------------------------ RN2H $\boxed{0}\ \boxed{R}\boxed{5}$ *K*
1 Ω → 010 ------------------------------ RS1P $\boxed{0}\boxed{1}\boxed{0}$ *K*

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ → 562×10¹ → 5621 ------------------------------ RN1/4PC $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ *F*

- *Parts marked by ☆ are important parts which relate in X-rays radiation.*
  If any of these parts need to be replaced, always replace with specified parts.
- *Parts marked by "×" are important parts which relate in X-rays radiation. If a failure occurs in any of these parts, replace the printed circuit board assembly where the relevant part has already been adjusted as a working component. Do not replace the actual part itself.*
  If any part marked by "×" is replaced, there is danger of being exposed to X-rays.

Mark	No.	Description	Parts No.
LIST OF ASSEMBLIES			
		CONTROL ASS'Y	BWV1039
		VIDEO ASS'Y	BWV1040
		H.V.& DEFLECTION ASS'Y	BWV1041
		CONVERGENCE ASS'Y	BWV1042
		├─CONVERGENCE ASS'Y	BWZ1643
		├─CONV. MODULE (RH) ASS'Y	BWZ1644
		├─CONV. MODULE (RV) ASS'Y	BWZ1645
		├─CONV. MODULE (GH) ASS'Y	BWZ1646
		├─CONV. MODULE (GV) ASS'Y	BWZ1647
		├─CONV. MODULE (BH) ASS'Y	BWZ1648
		└─CONV. MODULE (BV) ASS'Y	BWZ1649
		COMPLEX ASS'Y	BWV1043
		├─CONV. AMP ASS'Y	BWZ1650
		├─R CRT DRIVE ASS'Y	BWZ1651
		├─G CRT DRIVE ASS'Y	BWZ1652
		├─B CRT DRIVE ASS'Y	BWZ1653
		├─REAR LED ASS'Y	BWZ1654
		└─FAN CONNECTION ASS'Y	BWZ1655
		POWER SUPPLY ASS'Y(LU/CA model)	BWV1044
		POWER SUPPLY ASS'Y(WGWZ model)	BWV1045
CONTROL ASS'Y			
SEMICONDUCTORS			
	IC1004		M62358P
	IC1005		MC145407P
	IC1000		MC34064P
	IC1007		NJM78M05FAS
	IC1001		PD5378A9
	IC1006		TC4011BP
	IC1008,IC1701-IC1703		TC4053BP
	IC1002		UPD6258CX
	IC1003		UPD6453CY-001
	Q1002 ,Q1006 ,Q1013 ,Q1018		2SA1048
	Q1021 ,Q1022 ,Q1024 ,Q1026 ,Q1027		2SA1048
	Q1057 -Q1059 ,Q1067 -Q1077 ,Q1079		2SA1048
	Q1081 ,Q1085 -Q1090 ,Q1093 ,Q1095		2SA1048
	Q1098 -Q1100 ,Q1104 ,Q1105 ,Q1703		2SA1048
	Q1707 ,Q1711 ,Q1724 ,Q1729		2SA1048
	Q1735 ,Q1736 ,Q1738 ,Q1739		2SA1048
	Q1000 ,Q1001 ,Q1003 -Q1005 ,Q1007		2SC2458
	Q1009 -Q1012 ,Q1014 ,Q1015 ,Q1017		2SC2458
	Q1019 ,Q1020 ,Q1023 ,Q1025		2SC2458
	Q1029 -Q1042 ,Q1054 -Q1056		2SC2458
	Q1060 -Q1066 ,Q1078 ,Q1080		2SC2458
	Q1082 -Q1084 ,Q1091 ,Q1092 ,Q1094		2SC2458
	Q1096 ,Q1097 ,Q1101 -Q1103		2SC2458
	Q1701 ,Q1702 ,Q1704 -Q1706		2SC2458
	Q1708 -Q1710 ,Q1712 -Q1723		2SC2458
	Q1725 -Q1728 ,Q1730 -Q1733 ,Q1737		2SC2458
	Q1740		2SC2458
	Q1028 ,Q1043 -Q1053		2SC3327
	Q1008		2SD880
	Q1016		DTC124ES
	D1001 -D1006 ,D1008 ,D1043		HSS104-02
	D1051 -D1055 ,D1059 ,D1063 ,D1064		HSS104-02
	D1087 ,D1092 ,D1093 ,D1096		HSS104-02
	D1701 -D1709 ,D1712		HSS104-02
	D1056 ,D1072 -D1079 ,D1086		RD15ESB
	D1710 ,D1711 ,D1713 -D1716		RD15ESB
	D1094		RD3.0ESB
	D1107 -D1109		RD4.7ESB1
	D1007 ,D1011		RD5.1ESB2
	D1009 ,D1010 ,D1012 -D1042		RD5.6ESB
	D1044 -D1050 ,D1057 ,D1058 ,D1060		RD5.6ESB
	D1080 -D1082 ,D1095 ,D1097 ,D1098		RD5.6ESB
	D1101		RD5.6ESB
	D1061 ,D1099 ,D1100 ,D1102		RD6.8ESB
	D1105 ,D1106		RD6.8ESB
	D1103 ,D1104		RD8.2ESB
COILS AND FILTERS			
	L1704		ATG1006
	L1712		ATG1008
	DL1702		ATN1011
	DL1701		ATN1013
	L1000 -L1002		LAU100J

Mark	No.	Description	Parts No.
	L1702		LAU150J
	L1701		LAU150K
	L1706		LAU1R8J
	L1003		LAU270J
	L1004		LAU2R2J
	L1705 ,L1707 ,L1710		LAU3R9K
	L1703 ,L1708		LAU470K
	L1713		LAU820K
	L1709 ,L1711		LAU8R2K
SWITCHES AND RELAYS			
	S1000		ASH1003
	S1701		ASH1015
	RY1000		ASR1040
CAPACITORS			
	TC1000	(5.2pF-30pF)	ACM-017
	C1022 ,C1742		CCCCH101J50
	C1710 ,C1727 ,C1728		CCCCH151J50
	C1713 ,C1726		CCCCH181J50
	C1014 ,C1015		CCCCH220J50
	C1048 ,C1049 ,C1052 ,C1063 ,C1714		CCCCH221J50
	C1717		CCCCH221J50
	C1044 -C1047		CCCCH271J50
	C1708		CCCCH330J50
	C1749		CCCCH470J50
	C1002 ,C1003 ,C1006		CEAS010M50
	C1016 ,C1020 ,C1032 -C1034 ,C1036		CEAS100M50
	C1051 ,C1060 ,C1086 ,C1704		CEAS100M50
	C1007 ,C1012 ,C1025 ,C1709		CEAS101M10
	C1055 -C1057 ,C1729 ,C1739		CEAS101M25
	C1745		CEAS101M50
	C1737		CEAS221M16
	C1009 ,C1061		CEAS221M25
	C1004		CEAS222M16
	C1720		CEAS330M25
	C1072		CEAS330M50
	C1000 ,C1013 ,C1017 ,C1024 ,C1028		CEAS470M25
	C1030 ,C1039 ,C1040 ,C1043 ,C1050		CEAS470M25
	C1053 ,C1058 ,C1064 ,C1069 ,C1073		CEAS470M25
	C1078 ,C1082 ,C1701 ,C1707 ,C1716		CEAS470M25
	C1718 ,C1724 ,C1732 ,C1741		CEAS470M25
	C1733		CEAS471M16
	C1070 ,C1711		CEASR47M50
	C1071		CEASR68M50
	C1081		CFTXA473J50
	C1706		CKCYB102K50
	C1005 ,C1008 ,C1010 ,C1011		CKCYB103K50
	C1018 ,C1019 ,C1021 ,C1023		CKCYB103K50
	C1026 ,C1027 ,C1029 ,C1031 ,C1035		CKCYB103K50
	C1037 ,C1038 ,C1041 ,C1042 ,C1054		CKCYB103K50
	C1059 ,C1062 ,C1065 -C1068 ,C1074		CKCYB103K50
	C1076 ,C1077 ,C1079 ,C1080 ,C1702		CKCYB103K50
	C1715 ,C1721 ,C1722 ,C1747 ,C1748		CKCYB103K50
	C1001 ,C1075		CKCYB472K50
	C1723 ,C1731 ,C1735 ,C1736 ,C1738		CKCYF103Z50
	C1746		CKCYF103Z50
	C1703 ,C1705 ,C1712 ,C1719 ,C1725		CKCYX103M25
	C1730 ,C1740 ,C1743 ,C1744		CKCYX103M25
	C1734		CKCYX104M25
	C1750		CQMA182J50
RESISTORS			
	R1785		RD1/2PM470J
	R1809		RD1/2PMFL2R2J
	R1264		RD1/2PMFL561J
	R1109		RN1/4PC1001F
	R1408		RN1/4PC1202F

Mark	No.	Description	Parts No.
	R1114		RS1LMF100J
	R1134		RS1LMF220J
	VR1701	(1KΩ)	ACP1040
	Other Resistors		RD1/4PU□□□J
OTHERS			
		SCREW	ABZ30P080FZK
	CN1009	JACK	AKN-207
	CN1010,CN1011	SOCKET	AKP1117
		CONNECTOR	AKX1002
		HEAT SINK M	ANH-697
	CN1006	SOCKET(25P D-SUB)	BKP1055
	X1001	(4.9152MHz)	BSS1045
	CN1003,CN1701	PLUG 12-P	KM250MA12
	CN1002	PLUG 3-P	KM250MA3
	CN1000	PLUG 4-P	KM250MA4
	CN1007	PLUG 4-P	KM250MA4R
	CN1001,CN1005	PLUG 5-P	KM250MA5
	CN1008	PLUG 6-P	KM250MA6
	CN1004	PLUG 7-P	KM250MA7

VIDEO ASS'Y

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	IC2003		CXA1616S
	IC2501		M51387P
	IC2203		PA0030
	IC2502		TA8751AN
	IC2202		TA8759BN
	IC2503		TC40174BP
	IC2001,IC2002		TC4053BP
	IC2204		TC4538BP
	IC2201		TDA4565
	Q2003 ,Q2004 ,Q2009 ,Q2011		2SA1048
	Q2213 ,Q2214 ,Q2216 ,Q2217 ,Q2220		2SA1048
	Q2222 ,Q2223 ,Q2230 ,Q2237 ,Q2241		2SA1048
	Q2251 ,Q2513 -Q2516 ,Q2522		2SA1048
	Q2524 -Q2529 ,Q2533 ,Q2535		2SA1048
	Q2537 -Q2541 ,Q2544 -Q2546		2SA1048
	Q2548 -Q2552 ,Q2555 ,Q2556		2SA1048
	Q2558 -Q2562 ,Q2567 ,Q2573 -Q2576		2SA1048
	Q2579 ,Q2581 -Q2583 ,Q2587 ,Q2588		2SA1048
	Q2590 ,Q2592 ,Q2594		2SA1048
	Q2001 ,Q2002 ,Q2005 -Q2007 ,Q2010		2SC2458
	Q2012 ,Q2013 ,Q2015 -Q2022		2SC2458
	Q2202 -Q2212 ,Q2215 ,Q2218 ,Q2219		2SC2458
	Q2221 ,Q2224 -Q2229 ,Q2231 -Q2233		2SC2458
	Q2235 ,Q2236 ,Q2242 ,Q2243 ,Q2245		2SC2458
	Q2248 -Q2250 ,Q2501 -Q2512		2SC2458
	Q2517 -Q2519 ,Q2523 ,Q2530 -Q2532		2SC2458
	Q2534 ,Q2536 ,Q2542 ,Q2543 ,Q2547		2SC2458
	Q2553 ,Q2554 ,Q2557 ,Q2563 -Q2566		2SC2458
	Q2568 -Q2572 ,Q2577 ,Q2578 ,Q2580		2SC2458
	Q2584 -Q2586 ,Q2589 ,Q2591 ,Q2593		2SC2458
	Q2595		2SC2458
	D2001 -D2020 ,D2023 -D2026		HSS104-02
	D2202 -D2218 ,D2220 -D2227		HSS104-02
	D2229 -D2240 ,D2242 ,D2505 -D2518		HSS104-02
	D2522 -D2537 ,D2540 -D2543		HSS104-02
	D2548 -D2584 ,D2586 -D2590 ,D2592		HSS104-02
	D2595 -D2597		HSS104-02
	D2538		HZS15-1L
	D2504		HZS3BLL
	D2544 -D2546		HZS9B1L
	D2547		RD10ESB
	D2246 -D2248 ,D2252		RD12ESB

Mark	No. Description	Parts No.
	D2021 ,D2022 ,D2027 ,D2201 ,D2241	RD15ESB
	D2585 ,D2591 ,D2593 ,D2594	RD15ESB
	D2228	RD5.1ESB
	D2243	RD6.2ESB
	D2244 ,D2245 ,D2249 -D2251 ,D2598	RD6.8ESB
	D2219	RD9.1ESB
COILS AND FILTERS		
	L2205	ATG1009
	DL2202	ATN1007
	DL2201	ATN1008
	DL2203	ATN1014
	DL2204	ATN1019
	L2201 ,L2202	LAU270K
	L2206 ,L2207	LAU330K
	L2204	LAU470K
	L2203	LAU680K
	L2501 -L2503	LAU6R8K
	L2208	LAU8R2K
	L2209	LTA562J
SWITCHES AND FILTERS		
	S2001	ASH1015
CAPACITORS		
	C2280	CCCCH120J50
	C2276	CCCCH181J50
	C2268	CCCCH220J50
	C2015	CCCCH221J50
	C2282	CCCCH330J50
	C2261	CCCCH390J50
	C2018 ,C2288	CCCCH470J50
	C2214 ,C2216 ,C2545 -C2547	CCCSL101J50
	C2221	CCCSL220J50
	C2206 ,C2542 -C2544	CCCSL221J50
	C2237 ,C2241	CCCSL270J50
	C2233	CCCSL271J50
	C2202	CCCSL330J50
	C2240	CCCSL470J50
	C2210 ,C2212 ,C2213	CCCSL680J50
	C2209 ,C2211 ,C2220	CCCSL820J50
	C2274	CEANP2R2M50
	C2575	CEANP3R3M50
	C2041 ,C2201	CEANP470M25
	C2207 ,C2208 ,C2223 ,C2227	CEAS010M50
	C2255 ,C2262 ,C2279 ,C2508 ,C2512	CEAS010M50
	C2515 ,C2517 -C2519 ,C2522	CEAS010M50
	C2524 ,C2525 ,C2529 -C2531 ,C2570	CEAS010M50
	C2283	CEAS0R1M50
	C2020 ,C2234 ,C2236 ,C2251	CEAS100M50
	C2287 ,C2503 ,C2505 ,C2507 ,C2523	CEAS100M50
	C2536 ,C2539 -C2541	CEAS100M50
	C2001 -C2008 ,C2245 ,C2502	CEAS101M10
	C2504 ,C2506	CEAS101M10
	C2225 ,C2259 ,C2302 ,C2521 ,C2537	CEAS101M25
	C2230 ,C2552 ,C2553 ,C2558	CEAS220M50
	C2563	CEAS220M50
	C2048 , C2271	CEAS221M16
	C2026	CEAS221M25
	C2244	CEAS222M16
	C2532 -C2534	CEAS2R2M50
	C2516 ,C2535	CEAS331M16
	C2033 ,C2035 ,C2215 ,C2231	CEAS470M25
	C2292 ,C2293 ,C2296 ,C2298 ,C2514	CEAS470M25
	C2520 ,C2526 ,C2550 ,C2557	CEAS470M25
	C2562 ,C2567 ,C2568 ,C2572 ,C2578	CEAS470M25
	C2580 ,C2582 -C2584	CEAS470M25
	C2217	CEAS470M50
	C2016	CEANP101M10
	C2548	CEANP470M25
	C2549	CEANP100M50
	C2555,C2560,C2566	CEANP220M16
	C2030 ,C2043 ,C2045 ,C2232 ,C2573	CEAS4R7M50
	C2226	CEAS6R8M50
	C2022 ,C2222 ,C2289 ,C2290	CEASR47M50
	C2203	CEASR68M50
	C2242 ,C2243 ,C2247 ,C2248 ,C2250	CFTXA104J50
	C2253	CFTXA104J50
	C2024 ,C2025 ,C2029 ,C2265	CFTXA224J50
	C2032 ,C2239 ,C2285 ,C2554 ,C2556	CKCYB102K50
	C2559 ,C2561 ,C2564 ,C2565	CKCYB102K50
	C2017 ,C2019 ,C2021 ,C2034 ,C2224	CKCYB103K50
	C2249 ,C2252 ,C2286 ,C2291	CKCYB103K50
	C2294 ,C2295 ,C2297 ,C2299 ,C2501	CKCYB103K50
	C2513 ,C2527 ,C2538 ,C2569 ,C2579	CKCYB103K50
	C2581	CKCYB103K50
	C2037	CKCYB332K50
	C2027	CKCYB392K500
	C2049,C2023 ,C2038 ,C2204 ,C2205	CKCYB471K50
	C2010 -C2014 ,C2040 ,C2044 ,C2046	CKCYB472K50
	C2571	CKCYB472K50
	C2272	CKCYB561K50
	C2218 ,C2238 ,C2246 ,C2254	CKCYF103Z50
	C2256 ,C2257 ,C2267 ,C2269 ,C2270	CKCYF103Z50
	C2301	CKCYF103Z50
	C2219 ,C2235 ,C2273 ,C2277	CKCYX104M25
	C2509 -C2511	CKCYX104M25
	C2574	CKCYX473M25
	C2284	CQMA102J50
	C2275	CQMA103J50
	C2028 ,C2039	CQMA104J50
	C2300	CQMA152J50
	C2281	CQMA223J50
	C2266	CQMA472J50
	C2263	CQMA473J50
	C2031	CQMA562J50
	C2258 ,C2264 ,C2278	CQMA563J50
	C2260	CQMA683J50
RESISTORS		
	R2270 (100KΩ/5W)	ACN1076
	R2650 -R2652	RD1/2PM101J
	R2382	RD1/2PM221J
	R2244	RD1/2PMFL4R7J
	R2383 ,R2384	RN1/4PC2001F
	R2044	RN1/4PC3901F
	R2385	RN1/4PC6801F
	VR2201 (470Ω)	ACP1039
	VR2203-VR2205 (4.7KΩ)	ACP1042
	VR2202 (10KΩ)	ACP1043
	Other Resistors	RD1/4PU□□□J
OTHERS		
	CONNECTOR	AKX1002
	X2203 (503KHz)	ASS1019
	X2201 (3.579545MHz)	ASS1091
	X2202 (4.433619MHz)	ASS1092
	CN2001 PLUG(9P D-SUB)	BKP1056
	CN2202,CN2203 PLUG 12-P	KM250MA12
	CN2201,CN2501 PLUG 4-P	KM250MA4
	CN2505 PLUG 4-P	KM250MA4R
	CN2204 PLUG 5-P	KM250MA5
	CN2506 PLUG 6-P	KM250MA6
	CN2503 PLUG 7-P	KM250MA7
	CN2502 PLUG 7-P	KM250MA7B

Mark	No.	Description	Parts No.
	CN2504	PLUG 7-P	KM250MA7R

H.V & DEFLECTION ASS'Y

SEMICONDUCTORS			
⚠	IC6004		M5223P
⚠	IC6002,IC6003		NJM4558DXP
⚠	IC6001		UPC1377C
	Q6009 -Q6022 ,Q6024		2SA933S
	Q4802		2SB951A
	Q6025 -Q6036		2SC1740S
	Q6037		2SC1845
	Q4803		2SC2458
	Q6006 ,Q6008		2SC2705
⚠	Q6003 ,Q6004		2SC3332
⚠	Q6023		2SC4633(A)
⚠	Q6005 ,Q6007		2SD1276A
	Q4801		2SD1277A
⚠	Q6001 ,Q6002		2SD2300(D)
⚠	D6021		11DF2FD
⚠	D6029 ,D6030		ES1F
	D4801 -D4804 ,D6001 ,D6005 ,D6006		HSS104-02
	D6008 ,D6010 -D6014 ,D6016		HSS104-02
	D6018 -D6020 ,D6025 ,D6027 ,D6031		HSS104-02
	D6003		HZS6B1L
	D6028		RD12ESB
	D6007		RD5.1ESB2
×	D6015		RD5.1ESB2
⚠	D6023 ,D6024		RP1H
⚠	D6022		RU1
⚠	D6004 ,D6017		S5688G
COILS AND FILTERS			
⚠	T6001 ,T6002		ATK1045
⚠	T6003		ATK1050
⚠×	T6004		ATK1094
⚠	L6002		ATL1084
	L6003		ATX1023
	L6001		LTA272J
CAPACITORS			
⚠	C6077	(4700pF/2KV)	ACG-035
⚠	C6067 ,C6070	(680pF/2KV)	ACG1024
	C6038	(33µF/160V)	ACH-370
⚠	C6066	(1µF/160V)	ACH-372
⚠	C6004	(10µF/160V)	ACH1117
	C6026		CCCSL101J50
	C6048 ,C6057 ,C6064 ,C6068		CCCSL101K500
	C6041		CCCSL271J50
	C6069		CEANP4R7M35
	C6035		CEAS221M16
	C6047 ,C6063		CEHAQ010M2C
	C6013 ,C6014 ,C6017 ,C6022 ,C6024		CEHAQ010M50
	C6027 ,C6028 ,C6036 ,C6037		CEHAQ010M50
	C6049 ,C6050 ,C6058 ,C6061		CEHAQ010M50
	C6005 ,C6025 ,C6073 ,C6082		CEHAQ100M50
	C6044 ,C6080 ,C6081		CEHAQ101M25
	C6087		CEHAQ101M50
	C6072		CEHAQ220M50
	C6065		CEHAQ221M16
	C6033 ,C6055		CEHAQ330M25
	C6008 ,C6020 ,C6052		CEHAQ331M16
	C6007 ,C6083		CEHAQ470M25
	C6075 ,C6085 ,C6086		CEHAQ470M2C
	C4803 ,C4804		CEHAQ471M50
⚠	C6002		CFPHW103H3D
⚠	C6003		CFPHW123H3D
⚠	C6001		CFPHW683J3A
⚠	C6078		CFPMW474J2D
	C6032		CFTXA474J50
	C4801		CKCYB102K50
	C6060		CKCYB102K500
	C4802 ,C6040		CKCYB222K50
	C6006		CKCYB331K50
	C6079		CKCYB391K500
	C6019 ,C6046 ,C6062 ,C6084,C6088		CKCYF103Z50
	C6056		CKCYF472Z500
	C6042 ,C6045 ,C6054		CKCYF473Z50
	C6016		CKCYX104M25
	C6029		CKDYF103Z50
	C6051 ,C6059		CQMA102J50
	C6043		CQMA103J50
	C6039		CQMA103K250
	C6030		CQMA104J50
	C6031		CQMA153J50
	C6011 ,C6074		CQMA183J50
	C6053		CQMA223J50
	C6034		CQMA333J50
	C6021		CQMA472J50
	C6010 ,C6071		CQMA473J50
	C6012		CQMA682J50
	C6009		CQMA683J50
	C6015		CQMA823J50
⚠	C6023		CQPA562G100
RESISTORS			
⚠	R6163	(47Ω/0.5W)	ACN-225
⚠	R6158 -R6160	(100KΩ/0.5W)	ACN1074
	R6126		RD1/2PM122J
	R6152		RD1/2PM102J
	R6099		RD1/2PM153J
	R6121		RD1/2PM162J
	R6136		RD1/2PM221J
	R6107		RD1/2PM222J
	R6137		RD1/2PM241J
	R6144		RD1/2PM470J
	R6117		RD1/2PM471J
	R6076		RD1/2PM821J
	R6112		RD1/2PMFL100J
	R4805 -R4807 ,R6162		RD1/2PMFL101J
	R6113		RD1/2PMFL102J
	R6175		RD1/2PMFL103J
	R6140		RD1/2PMFL2R2J
	R6070 ,R6084		RD1/2PMFL3R9J
	R6069		RD1/2PMFL470J
	R6101 ,R6123		RD1/2PMFL471J
	R4803 ,R6118		RD1/2PMFL472J
	R6086		RD1/2PMFL682J
⚠	R6161		RN1/2PC3602F
⚠	R6154		RN1/2PC3902F
	R6108		RN1/2PC4702F
	R6141		RN1/2PC6800F
	R6094		RN1/4PC1001F
	R6068 ,R6104 ,R6156 ,R6179		RN1/4PC1002F
×	R6087		RN1/4PC1003F
	R6040 ,R6065		RN1/4PC1202F
	R6063 ,R6096		RN1/4PC1502F
	R6082 ,R6085 ,R6157 ,R6180		RN1/4PC2201F
	R6093 ,R6146		RN1/4PC3301F
	R6039 ,R6151		RN1/4PC3302F
	R6078		RN1/4PC3901F
	R6072		RN1/4PC4701F
	R4804		RN1/4PC5100F

Mark	No. Description	Parts No.
	R6081	RN1/4PC5101F
	R6178	RN1/4PC5602F
	R6170	RN1/4PC6201F
	R6067	RN1/4PC7501F
×	R6071	RN1/4PC7502F
	R6130 ,R6133 ,R6139 ,R6143 ,R6149	RS1LMF563J
	R6129 ,R6132 ,R6138 ,R6142 ,R6150	RS1LMF683J
	R4801 ,R4802	RS2LMF1R8J
	R4808	RS2LMF2R2J
	R6125	RS2PMF1R5J
	R6148	RS2PMF220J
	R6131	RS2PMFR47J
	R6002	RS3LMF332J
	R6176	RS3LMF392J
	R6122	RS3PMF512J
×	R6120	RD1/4PU122J
×	R6135	RD1/4PU912J
	VR6002	VRTS6VS102
×	VR6006	VRTS6VS102
	VR6005	VRTS6VS222
×	VR6004	VRTS6VS223
	VR6001,VR6003	VRTS6VS472
	Other Resistors	RD1/4PU□□□J

OTHERS

Mark	No. Description	Parts No.
	SCREW	ABA-234
	CN6003 PLUG 3-P	AKM1055
	CN6004-CN6006 PLUG 4-P	AKM1066
	FUSE HOLDER	AKR-035
	SHIELD CASE	ANH1165
	SCREW	BBZ30P080FCU
	CN6001 PLUG 11-P	KM250MA11
	CN4801-CN4803 PLUG 3-P	KM250MA3
	CN6002 PLUG 5-P	KM250MA5
	CN6007 PLUG 6-P	KM250MA6
	CN4804 PLUG 6-P	KM250MA6R
	CN6008 PLUG 9-P	KM250MA9
	SCREW	PBZ30P080FMC
	SCREW	VPZ40P100FMC

CONVERGENCE ASS'Y

SEMICONDUCTORS

Mark	No. Description	Parts No.
	IC7015,IC7017,IC7326,IC7328	M5220L
	IC7003,IC7004	PA0053B
	IC7011	PM0002B
	IC7021	TC74HC10AP
	Q7108 ,Q7109 ,Q7353	2SA1115
	Q7005 ,Q7011 ,Q7012 ,Q7101 -Q7105	2SC2458
	Q7201 ,Q7211 ,Q7221 ,Q7231 ,Q7241	2SC2458
	Q7251 ,Q7352 ,Q7354 -Q7359	2SC2458
	D7038 ,D7039 ,D7438 ,D7440	HSS104-02
	D7121 ,D7439	HZS6C1L
	D7003 ,D7005 ,D7007 -D7019	RD12ESB
	D7054 ,D7055 ,D7063 ,D7064	RD12ESB
	D7399 -D7402 ,D7426 -D7429	RD12ESB
	D7434 -D7437	RD12ESB
	D7040	RD20ESB

CAPACITORS

Mark	No. Description	Parts No.
	C7004 ,C7090 ,C7092 ,C7495	CCCCH150J50
	C7505 ,C7506	CCCCH150J50
	C7102	CCCCH151J50
	C7094	CCCCH330J50
	C7104	CCCCH390J50
	C7101	CCCCH560J50
	C7008 ,C7010 ,C7011	CEAS010M50
	C7096 -C7099 ,C7121 ,C7459 ,C7460	CEAS101M10
	C7486 ,C7487 ,C7497 ,C7498 ,C7508	CEAS101M10
	C7510	CEAS101M10
	C7053	CEAS101M50
	C7054 ,C7055	CEAS102M6
	C7020	CEAS1R5M50
	C7019	CEAS220M50
	C7018 ,C7021	CEAS330M50
	C7017	CEAS470M25
	C7009	CEASR47M50
	C7014 ,C7015	CFTYA224J50
	C7001 ,C7002 ,C7006 ,C7012 ,C7013	CKCYF103Z50
	C7052 ,C7056 ,C7057 ,C7091 ,C7093	CKCYF103Z50
	C7105 ,C7106 ,C7398 ,C7399 ,C7496	CKCYF103Z50
	C7499 ,C7507 ,C7509	CKCYF103Z50
	C7007	CQMA102J50
	C7016	CQMA154J50
	C7042	CQPA102F100
	C7044	CQPA331F100
	C7043	CQPA471F100

RESISTORS

Mark	No. Description	Parts No.
	R7117 ,R7118 ,R7386 ,R7387 ,R7512	RN1/4PC1002F
	R7516	RN1/4PC1002F
	R7500 ,R7504 ,R7539 ,R7540	RN1/4PC1003F
	R7384	RN1/4PC1004F
	R7379	RN1/4PC1202F
	R7293 ,R7307 ,R7316	RN1/4PC1502F
	R7302 ,R7315	RN1/4PC1503F
	R7123	RN1/4PC1802F
	R7115 ,R7116 ,R7514 ,R7515	RN1/4PC2002F
	R7503	RN1/4PC2003F
	R7502	RN1/4PC2200F
	R7501	RN1/4PC2203F
	R7120	RN1/4PC2402F
	R7536	RN1/4PC2403F
	R7291 ,R7305 ,R7312	RN1/4PC3002F
	R7205 ,R7215 ,R7225 ,R7235 ,R7245	RN1/4PC3300F
	R7255	RN1/4PC3300F
	R7282	RN1/4PC3302F
	R7171	RN1/4PC3303F
	R7303 ,R7314	RN1/4PC3602F
	R7537 ,R7538 ,R7541	RN1/4PC4303F
	R7378 ,R7513 ,R7517 -R7519	RN1/4PC4702F
	R7261 ,R7272 ,R7277 ,R7283	RN1/4PC5102F
	R7533	RN1/4PC5103F
	R7294 ,R7308 ,R7317 ,R7534	RN1/4PC8202F
	Other Resistors	RD1/4PU□□□J

OTHERS

Mark	No. Description	Parts No.
	CN7207-CN7212 16P PLUG	KM200IA16
	CN7201-CN7206 20P PLUG	KM200IA20
	CN7002,CN7218 PLUG 3-P	KM250MA3
	CN7220 PLUG 3-P	KM250MA3B
	CN7028 PLUG 4-P	KM250MA4
	CN7022,CN7029,CN7213 PLUG 5-P	KM250MA5
	CN7214 PLUG 5-P	KM250MA5R
	CN7215 PLUG 6-P	KM250MA6
	CN7023 PLUG 8-P	KM250MA8
	CN7216 PLUG 8-P	KM250MA8R

CONV. MODULE (RH) ASS'Y

SEMICONDUCTORS

Mark	No. Description	Parts No.
	IC3001	PM0002B
	D3001 ,D3002	HZS6C1L

Mark	No.	Description	Parts No.
CAPACITORS			
	C3001 ,C3003		CEHAQ471M10
	C3002 ,C3004		CKCYF103Z50
RESISTORS			
	R3016 ,R3017		RN1/4PC1002F
	R3010 -R3015		RN1/4PC3302F
	Other Resistors		RD1/4PU☐☐☐J
OTHERS			
	CN3002	16P SOCKET	KP200IA16L
	CN3001	20P SOCKET	KP200IA20L

CONV. MODULE (RV) ASS'Y

SEMICONDUCTORS			
	IC3051		PM0002B
	D3051 ,D3052		HZS6C1L
CAPACITORS			
	C3051 ,C3053		CEHAQ471M10
	C3052 ,C3054		CKCYF103Z50
RESISTORS			
	R3066 ,R3067		RN1/4PC1002F
	R3060 -R3065		RN1/4PC3302F
	Other Resistors		RD1/4PU☐☐☐J
OTHERS			
	CN3052	16P SOCKET	KP200IA16L
	CN3051	20P SOCKET	KP200IA20L

CONV. MODULE (GH) ASS'Y

SEMICONDUCTORS			
	IC3101		PM0002B
	D3101 ,D3102		HZS6C1L
CAPACITORS			
	C3101 ,C3103		CEHAQ471M10
	C3102 ,C3104		CKCYF103Z50
RESISITORS			
	R3116 ,R3117		RN1/4PC1002F
	R3110 -R3115		RN1/4PC3302F
	Other Resistors		RD1/4PU☐☐☐J
OTHERS			
	CN3102	16P SOCKET	KP200IA16L
	CN3101	20P SOCKET	KP200IA20L

CONV. MODULE (GV) ASS'Y

SEMICONDUCTORS			
	IC3151		PM0002B
	D3151 ,D3152		HZS6C1L
CAPACITORS			
	C3151 ,C3153		CEHAQ471M10
	C3152 ,C3154		CKCYF103Z50
RESISTORS			
	R3166 ,R3167		RN1/4PC1002F
	R3160 -R3165		RN1/4PC3302F
	Other Resistors		RD1/4PU☐☐☐J
OTHERS			
	CN3152	16P SOCKET	KP200IA16L
	CN3151	20P SOCKET	KP200IA20L

CONV. MODULE (BH) ASS'Y

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	IC3201		PM0002B
	D3201 ,D3202		HZS6C1L
CAPACITORS			
	C3201 ,C3203		CEHAQ471M10
	C3202 ,C3204		CKCYF103Z50
RESISTORS			
	R3216 ,R3217		RN1/4PC1002F
	R3210 -R3215		RN1/4PC3302F
	Other Resistors		RD1/4PU☐☐☐J
OTHERS			
	CN3202	16P SOCKET	KP200IA16L
	CN3201	20P SOCKET	KP200IA20L

CONV. MODULE (BV) ASS'Y

SEMICONDUCTORS			
	IC3251		PM0002B
	D3251 ,D3252		HZS6C1L
CAPACITORS			
	C3251 ,C3253		CEHAQ471M10
	C3252 ,C3254		CKCYF103Z50
RESISTORS			
	R3266 ,R3267		RN1/4PC1002F
	R3260 -R3265		RN1/4PC3302F
	Other Resistors		RD1/4PU☐☐☐J
OTHERS			
	CN3252	16P SOCKET	KP200IA16L
	CN3251	20P SOCKET	KP200IA20L

CONV. AMP ASS'Y

SEMICONDUCTORS			
	IC4703,IC4704		M5223L
	IC4502		NJM7805FAS
	IC4501		NJM7905FA
	IC4503,IC4504		STK392-110
	IC4701,IC4702		TC74HC4538AP
	IC4705		UPC78L05J
	Q4502 ,Q4515 -Q4517 ,Q4704 -Q4707		2SA1115
	Q4501 ,Q4503 ,Q4504 ,Q4509 ,Q4511		2SC2458
	Q4513 ,Q4514 ,Q4701 -Q4703		2SC2458
	D4501 -D4503 ,D4509 ,D4511 ,D4512		HSS104-02
	D4701 ,D4702		HSS104-02
COILS AND FILTERS			
	L4503 -L4505		ATH-059
CAPACITORS			
	C4506 ,C4507 ,C4510 ,C4536 ,C4537		CCCCH151J50
	C4540		CCCCH151J50
	C4530		CEANP2R2M50
	C4529		CEAS0R1M50
	C4704 ,C4708 ,C4714 ,C4719 ,C4722		CEAS101M10
	C4508 ,C4509 ,C4538 ,C4539		CEAS471M35
	C4504 ,C4505 ,C4522 ,C4531 ,C4532		CEHAQ101M10
	C4511 -C4513 ,C4541 ,C4542 ,C4546		CEHAQ101M50
	C4535 ,C4545		CEHAQ2R2M50
	C4727		CEHAQ470M25
	C4502 ,C4503		CEHAQ471M16
	C4705 ,C4711		CFTXA824J50
	C4516		CKCYB102K50
	C4520		CKCYB331K50
	C4703 ,C4707 ,C4713 ,C4718 ,C4721		CKCYF103Z50
	C4723		CKCYF103Z50
	C4514 ,C4515 ,C4523 -C4528		CKCYF473Z50
	C4543 ,C4544		CKCYF473Z50
	C4521		CKDYF103Z50
	C4706 ,C4709 ,C4710 ,C4712		CQMA103J50

Mark	No.	Description	Parts No.
	C4715,C4716,C4720,C4725,C4726		CQMA103J50
	C4728		CQMA103J50
	C4701,C4702,C4717,C4724		CQPA561F100
RESISTORS			
	R4535,R4536,R4573,R4574		RD1/2PMFL101J
	R4508,R4509,R4724		RD1/2PMFL471J
	R4518		RN1/4PC1000F
	R4516,R4707		RN1/4PC1002F
	R4708		RN1/4PC1202F
	R4519		RN1/4PC1301F
	R4717		RN1/4PC1302F
	R4718,R4720		RN1/4PC1502F
	R4702,R4703,R4712,R4713		RN1/4PC2200F
	R4714		RN1/4PC2201F
	R4721		RN1/4PC2202F
	R4730		RN1/4PC3901F
	R4556-R4558,R4578-R4580		RN1/4PC3300F
	R4510-R4512,R4528,R4553-R4555		RN1/4PC3301F
	R4567-R4569,R4575-R4577		RN1/4PC3301F
	R4722		RN1/4PC3902F
	R4515,R4517		RN1/4PC4700F
	R4705,R4706,R4715,R4716		RN1/4PC4702F
	R4514		RN1/4PC5100F
	R4701		RN1/4PC6202F
	R4524,R4525		RN1/4PC6800F
	R4704,R4710		RN1/4PC7501F
	R4709,R4719		RN1/4PC9101F
	R4549		RS1LMF010J
	R4561-R4566		RS1LMF820J
	R4526,R4532-R4534,R4570-R4572		RS2LMF010J
	R4502,R4506		RS3LMFR22J
	R4585		RT10PD150K
	Other Resistors		RD1/4PU□□□J
OTHERS			
	SCREW		ABA-234
	TAPPING SCREW(STEEL)		ABA1069
	SCREW		BBZ30P080FZK
	CN4508	PLUG 10-P	KM250MA10
	CN4505	PLUG 3-P	KM250MA3B
	CN4502	PLUG 4-P	KM250MA4
	CN4501	PLUG 4-P	KM250MA4B
	CN4503	PLUG 4-P	KM250MA4R
	CN4506	PLUG 5-P	KM250MA5
	CN4511	PLUG 5-P	KM250MA5R
	CN4701	PLUG 6-P	KM250MA6
	CN4512	PLUG 6-P	KM250MA6B
	CN4507	PLUG 8-P	KM250MA8R

R CRT DRIVE ASS'Y

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	Q4004,Q4005,Q4007		2SA1371
	Q4002		2SC2458
⚠	Q4003		2SC2611
	Q4006		2SC3468
	D4002-D4004		1SS145
	D4005		HSS104-02
COILS AND FILTERS			
	L4001		LAU101J
	L4003		LAU220J
	L4002		LAU470J
CAPACITORS			
⚠	C4007	(1000pF/2KV)	ACG1001
	C4002	(22µF/250V)	BCH1003
	C4005		CCCSL101J50
	C4001,C4003		CEAS101M25
	C4006		CKCYB102K50
	C4004		CKCYB681K50
RESISTORS			
⚠	R4013	(1.8KΩ/0.5W)	ACN-221
⚠	R4017	(47Ω/0.5W)	ACN-225
	R4012		RD1/2PM103J
	R4015		RD1/2PM104J
	R4014		RD1/2PM224J
	R4016		RS2LMF473J
	R4002,R4006		RS3LMF332J
	Other Resistors		RD1/4PU□□□J
OTHERS			
⚠	CRT SOCKET		AKG1004
	HEAT SINK M3		ANH1409
	SCREW		BMZ30P080FMC
	CN4001	PLUG 7-P	KM250MA7R

G CRT DRIVE ASS'Y

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	Q4104,Q4105,Q4107		2SA1371
	Q4102		2SC2458
⚠	Q4103		2SC2611
	Q4106		2SC3468
⚠	Q4108		2SD1276A
	D4102-D4104		1SS145
	D4105		HSS104-02
	D4107		RD12ESB
COILS AND FILTERS			
	L4101		LAU101J
	L4103		LAU220J
	L4102		LAU470J
CAPACITORS			
⚠	C4107	(1000pF/2KV)	ACG1001
	C4108	(4.7µF/250V)	ACH-378
	C4102	(22µF/250V)	BCH1003
	C4105		CCCSL101J50
	C4101,C4103		CEAS101M25
	C4106		CKCYB102K50
	C4104		CKCYB681K50
RESISTORS			
⚠	R4113	(1.8KΩ/0.5W)	ACN-221
⚠	R4117	(47Ω/0.5W)	ACN-225
	R4112		RD1/2PM103J
	R4115		RD1/2PM104J
	R4114		RD1/2PM224J
	R4119		RD1/2PMFL563J
	R4116		RS2LMF473J
	R4102,R4106		RS3LMF332J
	Other Resistors		RD1/4PU□□□J
OTHERS			
⚠	CRT SOCKET		AKG1004
	HEAT SINK M3		ANH1409
	SCREW		BMZ30P080FMC
	CN4101	PLUG 5-P	KM250MA5
	CN4102	PLUG 7-P	KM250MA7

B CRT DRIVE ASS'Y

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	Q4204,Q4205,Q4207		2SA1371
	Q4202		2SC2458
⚠	Q4203		2SC2611
	Q4206		2SC3468

Mark	No.	Description	Parts No.
	D4202 -D4204		1SS145
	D4205		HSS104-02
	COILS AND FILTERS		
	L4201		LAU101J
	L4203		LAU220J
	L4202		LAU470J
	CAPACITORS		
⚠	C4207	(1000pF/2KV)	ACG1001
	C4202	(22µF/250V)	BCH1003
	C4205		CCCSL101J50
	C4201 ,C4203		CEAS101M25
	C4206		CKCYB102K50
	C4204		CKCYB681K50
	RESISTORS		
⚠	R4213	(1.8KΩ/0.5W)	ACN-221
⚠	R4217	(47Ω/0.5W)	ACN-225
	R4212		RD1/2PM103J
	R4215		RD1/2PM104J
	R4214		RD1/2PM224J
	R4216		RS2LMF473J
	R4202 ,R4206		RS3LMF332J
	Other Resistors		RD1/4PU☐☐☐J
	OTHERS		
⚠	CRT SOCKET		AKG1004
	HEAT SINK M3		ANH1409
	SCREW		BMZ30P080FMC
	CN4201	PLUG 7-P	KM250MA7B
	REAR LED ASS'Y		
	SEMICONDUCTORS		
	IC4902		M66311P
	IC4901		PD5136
	Q4901 ,Q4902		2SA1048
	D4904 -D4911		AEL1017
	D4912		AEL1058
	D4902 ,D4903		HSS104-02
	D4901		RD3.0ESB
	D4913 -D4915		RD5.6ESB
	SWITCHES AND RELAYS		
	S4901 -S4906		BSG1016
	CAPACITORS		
	C4901 ,C4902		CCCCH221J50
	C4903		CEJA2R2M50
	C4907 ,C4909		CEJA470M16
	C4904		CFTXA104J50
	C4905 ,C4906 ,C4908		CKCYB472K50
	RESISTORS		
	Other Resistors		RD1/4PU☐☐☐J
	OTHER.S		
	X4901	(480KHz)	ASS1043
	FAN JUNCTION ASS'Y		
	CAPACITORS		
	C4950		CEAS101M35
	RESISTORS		
	Other Resistors		RD1/4PU☐☐☐J
	OTHERS		
	CN4950	PLUG 3-P	KM250MA3LR

Mark	No.	Description	Parts No.
	POWER SUPPLY ASS'Y (for LU/CA model)		
	SEMICONDUCTORS		
	IC5001		M5233P
⚠	IC5002		ON3171-Q
	IC5004		PQ30RV11(A)
⚠	IC5003		TA76431S
	Q5003 ,Q5007 ,Q5009 ,Q5020		2SA933S
	Q5018 ,Q5021		2SB1566
	Q5002 ,Q5006 ,Q5008 ,Q5010 -Q5012		2SC1740S
	Q5014 ,Q5019		2SC1740S
⚠	Q5005		2SC2705
	Q5001 ,Q5004 ,Q5013 ,Q5015 -Q5017		2SD1835
⚠	Q5000		2SK1342-06
	D5038		1SS145
	D5019		AEL1075
	D5053		AEL1128
	D5001 -D5005 ,D5007 -D5011		HSS104-02
	D5014 -D5018 ,D5021 ,D5024		HSS104-02
	D5026 -D5029 ,D5035 ,D5041 ,D5042		HSS104-02
	D5045 ,D5048 -D5050 ,D5052		HSS104-02
	D5054 ,D5055 ,D5063 ,D5065 -D5067		HSS104-02
	D5070 ,D5071		HSS104-02
	D5000		HZS24-3L
	D5006		HZS5BLL
	D5039		HZS6A2L
	D5025 ,D5051		HZS6C2L
	D5043		RBV-604(A)
	D5012 ,D5023 ,D5036 ,D5056		RD12ESB1
	D5064		RD2.0ESB1
	D5046		RD3.3ESB1
	D5022		RD4.7ESB
⚠	D5013		RG4C(A)
	D5020 ,D5044 ,D5057 -D5062		RL4Z(A)
	D5037		RU4A(A)
	D5030 -D5033		S5688G
	COILS AND FILTERS		
⚠	L5021		ATF1118
⚠	L5022		ATF1154
⚠	L5023		ATF1158
	L5000 -L5005 ,L5007 -L5020		ATX1023
	TRANSFORMERS		
⚠	T5000		ATT1145
⚠	T5001		BTK1002
	SWITCHES AND RELAYS		
⚠	RY5000-RY5002		ASR1036
	CAPACITORS		
⚠	C5008	(0.047µF/400V)	ACE1047
⚠	C5032 -C5035	(1.0µF/AC250V)	ACE1050
	C5040 -C5043	(0.01µF/AC250V)	ACG-001
	C5061	(220pF/2KV)	ACG-050
⚠	C5000 ,C5001	(4700pF/AC250V)	ACG7013
⚠	C5010 ,C5011	(4700pF/AC250V)	ACG7013
	C5017	(560µF/160V)	ACH1146
⚠	C5047 ,C5048	(1000µF/200V)	ACH1164
⚠	C5009	(2.2µF/25V)	ACH1278
	C5021 ,C5022 ,C5026	(3300µF/50V)	ACH1280
	C5039,C5050	(3300µF/50V)	ACH1280
	C5070		CCCSL121J50
	C5014 -C5016 ,C5018 ,C5019 ,C5049		CCCSL221K500
	C5045		CCCSL470J50
	C5020		CEAS101M10
	C5054		CEAS102M25
	C5005		CEAS220M50
	C5059		CEAS222M16

RM-V2400NA,RM-V2500NA
RM-V2400NE,RM-V2500NE

Mark	No.	Description	Parts No.
	C5025		CEAS330M25
	C5036		CEAS332M25
	C5075		CEAS470M25
	C5046		CEAS470M50
	C5051		CEAS471M16
	C5013		CEHAQ010M50
	C5023 ,C5024 ,C5071 -C5073		CKCYB102K50
	C5012 ,C5028 -C5030 ,C5037 ,C5038		CKCYB103K50
	C5044 ,C5053 ,C5055 -C5057 ,C5060		CKCYB103K50
	C5058		CKCYB331K50
	C5027		CKCYF102Z50
	C5052		CKCYF103Z50
	C5031		CKCYF472Z500
	C5007 , C5076		CKDYF103Z50
	C5002 -C5004		CQMA103J50
	C5006		CQMA472J50
REISISTORS			
	R5117	(5.6Ω/5W)	ACN1033
	R5060 ,R5066	(2.7Ω/5W)	ACN1060
	R5000	(0.1Ω/5W)	ACN1098
	R5050		RD1/2PM153J
	R5032		RD1/2PM154J
	R5007		RD1/2PM161J
	R5071		RD1/2PM201J
	R5058 ,R5068		RD1/2PM394J
	R5009		RD1/2PM471J
	R5012		RD1/2PM472J
	R5003 ,R5005		RD1/2PM474J
	R5114		RD1/2PM4R7J
	R5004		RD1/2PM682J
⚠	R5001		RD1/2PMFL102J
⚠	R5100		RD1/2PMFL431J
⚠	R5002		RD1/2PMFL470J
	R5084		RD1/2PMFL470J
	R5070		RN1/4PC1502F
	R5057 ,R5110		RN1/4PC1603F
	R5015		RN1/4PC2202F
	R5018		RN1/4PC2702F
	R5104		RN1/4PC3001F
	R5056 ,R5069		RN1/4PC3601F
	R5014		RN1/4PC4700F
	R5020		RN1/4PC5102F
	R5105		RN1/4PC6800F
	R5017		RN1/4PC8201F
	R5033		RS1LMF223J
	R5072		RS1LMF331J
	R5022 ,R5023 ,R5101 ,R5102		RT10PZ222K
	VR5000		VRTS6VS102
	Other Resistors		RD1/4PU□□□J
OTHERS			
		SCREW	ABZ30P080FZK
		MICA SHEET	AEP-056
		FUSE CLIP	AKR1003
		HEAT SINK M	ANH-697
		HEAT SINK B	ANH1021
		GROUND PLATE	ANK-142
		SCREW	BBZ30P080FCU
		SCREW	BBZ30P080FZK
⚠	CN5000	PLUG 2-P	BKM1027
		SCREW	BMZ30P080FMC
	CN5003	PLUG 10-P	KM250MA10
	CN5005	PLUG 11-P	KM250MA11
	CN5001	PLUG 3-P	KM250MA3
	CN5002	PLUG 4-P	KM250MA4
	CN5004	PLUG 5-P	KM250MA5

Mark	No.	Description	Parts No.
		SCREW	VBB30P120FZB

POWER SUPPLY ASS'Y (for WGWZ model)

SEMICONDUCTORS			
	IC5001		M5233P
⚠	IC5002		ON3171-Q
	IC5004		PQ30RV11(A)
⚠	IC5003		TA76431S
	Q5003 ,Q5007 ,Q5009 ,Q5020		2SA933S
	Q5018 ,Q5021		2SB1566
	Q5002 ,Q5006 ,Q5008 ,Q5010 -Q5012		2SC1740S
	Q5014 ,Q5019		2SC1740S
⚠	Q5005		2SC2705
	Q5001 ,Q5004 ,Q5013 ,Q5015 -Q5017		2SD1835
⚠	Q5000		2SK1342-06
	D5038		1SS145
	D5019		AEL1075
	D5053		AEL1128
	D5001 -D5005 ,D5007 -D5011		HSS104-02
	D5014 -D5018 ,D5021 ,D5024		HSS104-02
	D5026 -D5029 ,D5035 ,D5041 ,D5042		HSS104-02
	D5045 ,D5048 -D5050 ,D5052		HSS104-02
	D5054 ,D5055 ,D5063 ,D5065 -D5067		HSS104-02
	D5070 ,D5071		HSS104-02
	D5000		HZS24-3L
	D5006		HZS5BLL
	D5039		HZS6A2L
	D5025 ,D5051		HZS6C2L
	D5043		RBV-604(A)
	D5012 ,D5023 ,D5036 ,D5056		RD12ESB1
	D5064		RD2.0ESB1
	D5046		RD3.3ESB1
	D5022		RD4.7ESB
⚠	D5013 ,D5034 ,D5040		RG4C(A)
	D5020 ,D5044 ,D5057 -D5062		RL4Z(A)
	D5037		RU4A(A)
	D5030 -D5033		S5688G
COILS AND FILTERS			
⚠	L5022		ATF1121
⚠	L5021		ATF1154
	L5000 -L5005 ,L5007 -L5020		ATX1023
	L5024 -L5027		ATX1023
⚠	L5006		BTK1003
TRANSFORMERS			
⚠	T5000		ATT1249
⚠	T5001		BTK1002
SWITCHES AND RELAYS			
⚠	RY5000-RY5002		ASR1036
CAPACITORS			
⚠	C5008	(0.047µF/400V)	ACE1047
⚠	C5033 -C5035	(1.0µF/AC250V)	ACE1050
	C5040 -C5043	(0.01µF/AC250V)	ACG-001
	C5074	(1000pF/2KV)	ACG-040
	C5061	(220pF/2KV)	ACG-050
⚠	C5000 ,C5001	(4700pF/AC250V)	ACG7013
	C5010,C5011	(4700pF/AC250V)	ACG7013
	C5017	(560pF/160V)	ACH1146
⚠	C5047 ,C5048	(1000µF/200V)	ACH1164
⚠	C5009	(2.2µF/25V)	ACH1278
	C5021 ,C5022 ,C5026	(3300µF/50V)	ACH1280
	C5039,C5050	(3300µF/50V)	ACH1280
	C5070		CCCSL121J50
	C5014 -C5016 ,C5018 ,C5019 ,C5049		CCCSL221K500

Mark	No.	Description	Parts No.
	C5045		CCCSL470J50
	C5020		CEAS101M10
	C5054		CEAS102M25
	C5005		CEAS220M50
	C5059		CEAS222M16
	C5025		CEAS330M25
	C5036		CEAS332M25
	C5075		CEAS470M25
	C5046		CEAS470M50
	C5051		CEAS471M16
	C5013		CEHAQ010M50
	C5023 ,C5024 ,C5071 -C5073		CKCYB102K50
	C5012 ,C5028 -C5030 ,C5037 ,C5038		CKCYB103K50
	C5044 ,C5053 ,C5055 -C5057 ,C5060		CKCYB103K50
	C5058		CKCYB331K50
	C5027		CKCYF102Z50
	C5052		CKCYF103Z50
	C5031		CKCYF472Z500
	C5007 , C5076		CKDYF103Z50
	C5002 -C5004		CQMA103J50
	C5006		CQMA472J50
RESISTORS			
	R5117	(5.6Ω/5W)	ACN1033
	R5060 ,R5066	(2.7Ω/5W)	ACN1060
	R5000	(0.1Ω/5W)	ACN1098
	R5050		RD1/2PM153J
	R5032		RD1/2PM154J
	R5007		RD1/2PM161J
	R5071		RD1/2PM201J
	R5058 ,R5068		RD1/2PM394J
	R5009		RD1/2PM471J
	R5012		RD1/2PM472J
	R5003 ,R5005		RD1/2PM474J
	R5114		RD1/2PM4R7J
	R5004		RD1/2PM682J
⚠	R5001		RD1/2PMFL102J
⚠	R5100		RD1/2PMFL431J
⚠	R5002		RD1/2PMFL470J
	R5084		RD1/2PMFL470J
	R5070		RN1/4PC1502F
	R5057 ,R5110		RN1/4PC1603F
	R5015		RN1/4PC2202F
	R5018		RN1/4PC2702F
	R5104		RN1/4PC3001F
	R5056 ,R5069		RN1/4PC3601F
	R5014		RN1/4PC4700F
	R5020		RN1/4PC5102F
	R5105		RN1/4PC6800F
	R5017		RN1/4PC8201F
	R5033		RS1LMF223J
	R5072		RS1LMF331J
	R5111 ,R5112 ,R5116 ,R5118		RS3LMF222J
	R5022 ,R5023 ,R5101 ,R5102		RT10PZ222K
	VR5000		VRTS6VS102
	Other Resistors		RD1/4PU☐☐☐J
OTHERS			
	SCREW		ABZ30P080FZK
	MICA SHEET		AEP-056
	FUSU CLIP		AKR1003
	HEAT SINK M		ANH-697
	HEAT SINK B		ANH1021
	GROUND PLATE		ANK-142
	SCREW		BBZ30P080FCU
	SCREW		BBZ30P080FZK
⚠	CN5000	PLUG 2-P	BKM1027
	SCREW		BMZ30P080FMC
	CN5003	PLUG 10-P	KM250MA10
	CN5005	PLUG 11-P	KM250MA11
	CN5001	PLUG 3-P	KM250MA3
	CN5002	PLUG 4-P	KM250MA4
	CN5004	PLUG 5-P	KM250MA5
	SCREW		VBB30P120FZB

7. DISASSEMBLY

<Note>

- When removing the rear panel, handle the cable connecting the fan with care. If this cable has to be removed, connect TP5050 (GND) and TP5051 (FAN P.D) inside the power supply assembly, if not, the FAN P.D will operate and power cannot be supplied to the unit.

- Pull out the control block about 30 cm.
  But if the projection unit is equipped with a frame or cabinet, as the inside of the video assembly and convergence assembly cannot be checked, check with the device connected to the connector.

1) Control assembly, video assembly, convergence assembly
   ① Remove the rear panel (four screws ①).
   ② Remove the bonnet (three screws ②).
   ③ Remove the two screws ③ of the control block (See Fig. 1.).
   ④ Pull out the control block, and remove the control assembly together with rear panel A (two screws ④ and three bosses). Then turn over the board in 180 degrees and fix it with the screws ④ removed as in the figure.

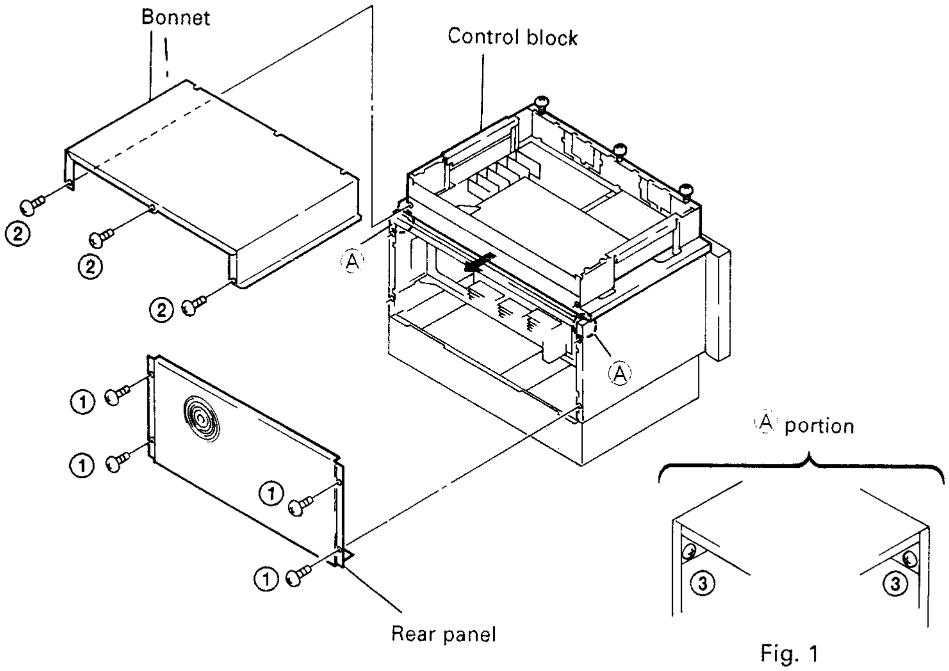
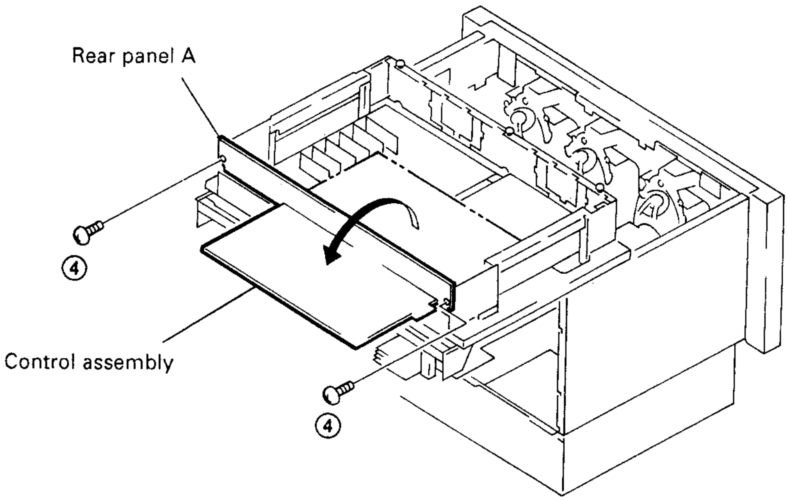
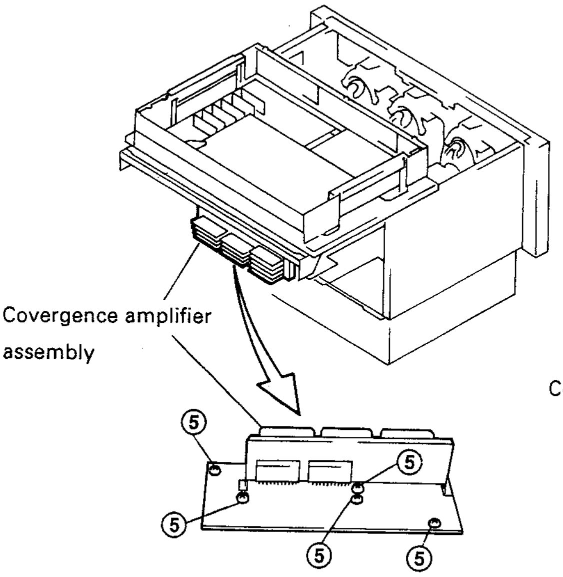


Fig. 1



2) Convergence amplifier assembly
   ① Remove the rear panel and bonnet, and pull out the control block.
   ② Remove the five screws ⑤ and three bosses securing the convergence amplifier assembly from below.
   ③ Push the board to the front and remove the assembly.
   ④ Face the copper-foil side as the rear, and tighten the screws ① as shown in Fig. 2 to secure the assembly.


Covergence amplifier assembly
⑤
⑤
⑤
⑤
⑤

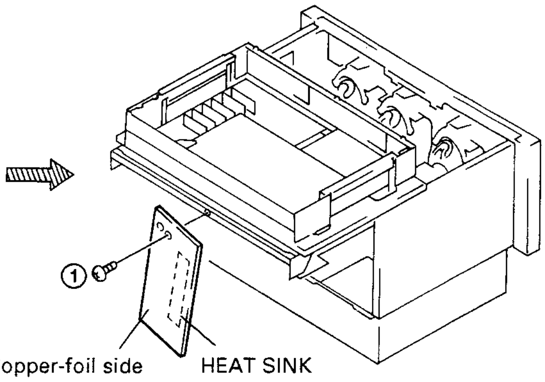
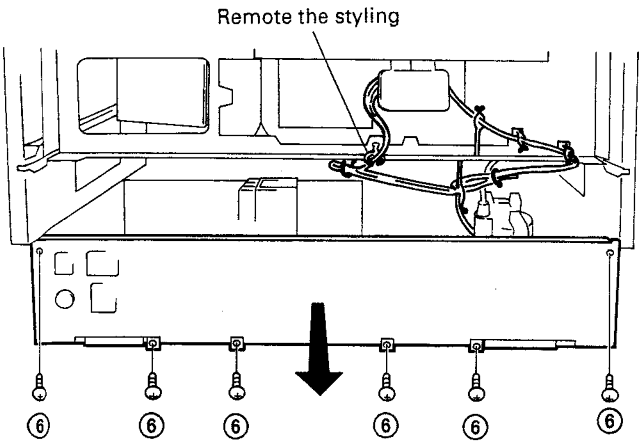
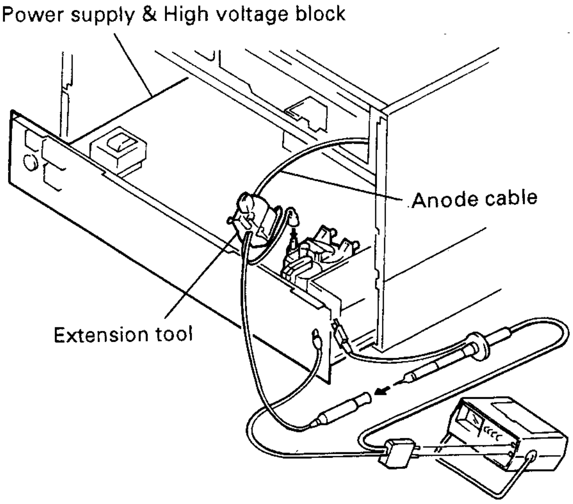

①
Copper-foil side
HEAT SINK

Fig. 2

3) High voltage and deflection assembly, power supply assembly
   ① Remove the rear panel.
   ② Remove the six screws ⑥ of the rear panel.
   ③ Remove the anode cable connected to FBT, and use the extension tool as the extension cable of the anode cable.
   ④ Remove the styling and pull out the high voltage block.


Remote the styling
⑥
⑥
⑥
⑥
⑥
⑥


Power supply & High voltage block
Anode cable
Extension tool

8. ADJUSTMENTS

Adjustments should be performed according to the sequence described in this chapter. After repair, the adjustment method differs depending on the repaired assembly. See Section "8.1.1 Adjustment Required After Repair or Replacement of Each Assembly" to confirm the items to be adjusted.

8.1 ADJUSTMENT OF EACH BLOCK

8.1.1 Adjustment Required After Repair or Replacement of Each Assembly

Step No. in ( ) corresponds to that in Section "8.1.2 Adjusting Each Part".

■ POWER Assembly

● After repaired

1) (Step 1) 135V power supply adjustment

■ H.V. & Deflection (H. DEF) Assembly

● After repaired or replaced

1) (Step 2) High voltage (anode voltage) adjustment
2) (Step 8) X-ray protective circuit adjustment
3) (Step 9) Focus adjustment

Note : Check the convergence, and adjust the main deflection & convergence according to Step 14 if it deviates.

■ VIDEO Assembly

● After repairs

1) (Step 3) NTSC comb filter adjustment
2) (Step 4) Decode section adjustment
3) (Step 5) V BLK pulse width adjustment
4) (Step 6) Synchronizing signal level adjustment
5) (Step 7) Screen voltage adjustment
6) (Step 15) White balance adjustment

● After replacements

1) (Step 7) Screen voltage adjustment
2) (Step 15) White balance adjustment

■ CONV. MODULE (RH, RV, GH, GV, BH, BV), CONVERGENCE, CONV. AMP Assemblies

● After repaired or replaced

1) Check the convergence, and adjust the convergence according to Step 14 if it deviates.

■ CONTROL Assembly

● After replaced

1) (Step 13) White balance, main deflection, convergence data and hour meter count number adjustment
2) (Step 12) ID assignment
3) (Step 15) White balance adjustment

● After repairs of Y/C separation section

1) (Step 3) NTSC comb filter adjustment
2) (Step 15) White balance adjustment

■ CRT DRIVE Assembly (R, G, B)

● After repaired or replaced

1) Check the white balance, and adjust the white balance according to Step 15 if it deviates.

■ CRT Assembly (R, G, B)

● If one or two CRT assemblies have been replaced, perform the following adjustments using the remaining CRT assemblies as a reference. If the remaining CRT assemblies include the green CRT assembly, use it as a reference.

1) (Step 9) Focus adjustment
2) (Step 10) Deflection yoke inclination adjustment
3) (Step 11) Screen center adjustment
4) (Step 14) Main deflection & convergence adjustment
5) (Step 15) White balance adjustment

■ Lens Assembly

● After replaced

1) (Step 9) Focus adjustment

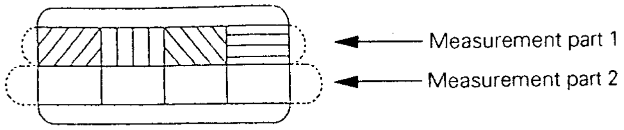
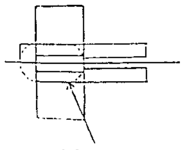
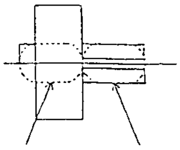
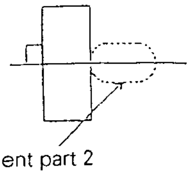
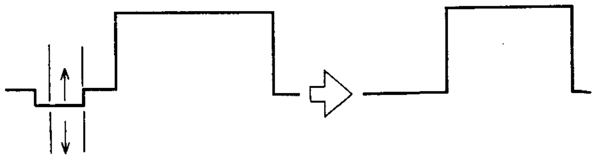
8.1.2 Adjusting Each Part

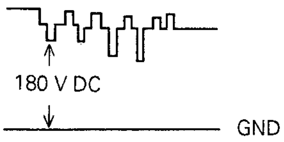
- For sections to be adjusted in each part and the TP terminal positions, refer to Fig. 8 - 11.
- G, R, and B shown in the columns "Sections to be adjusted" and "Adjusting method" are the abbreviations of green, red and blue respectively.
- A symbol in [ ] in the column "Sections to be adjusted" is the abbreviation of an assembly including the section to be adjusted.

The abbreviations are explained below.

V	: VIDEO assembly
PS	: POWER SUPPLY assembly
HV	: H. V & DEFLECTION (H. DEF) assembly
CO	: CONTROL assembly
VR	: Focus variable resistor

- The input signal is input to the "VIDEO" terminal on the rear panel unless otherwise specified.
- Set the picture quality during adjustment to "Standard" unless otherwise specified.

No.	Adjustment	Input signal	Selection to be adjusted	Adjusting method
1	135V power supply adjustment	Color bar	VR5000 [PS]	Set the TP5036 <+135V> or TP5029 <GND> connector voltage to DC 135V ± 0.5V.
2	High voltage (anode voltage) adjustment	Black burst	VR6004 [HV]	**Note :** Perform this adjustment only after the X-marked part is replaced. For the adjusting method, see Section "8. 1. 3 Adjusting The High Voltage Circuit".
3	NTSC comb filter adjustment	Color bar	VR1701 L1704 [CO]	While observing the Y signal of Pin 11 of CN1701, minimize the 3.58 MHz component.
4	Decode section adjustment	Demonstration pattern of Video S. G. (Philips PM5516)	L2205 VR2201 [V]	 Fig. a Observation point of waveform 1. Use L2205 to make the waveform of the measurement part 1 of pin 60 of IC2202 the same as shown in Fig. C. 2. Next, use VR2201 to make the waveform of the measurement part 2 the same as shown in Fig. d. 3. Repeat the above steps 1 and 2 several times. Confirm that the measurement part 1 of pin 62 of IC2202 is 50 mVp-p and that the measurement part 2 is 180 mVp-p or less.  Fig. b Before adjustment  Fig. c After adjustment  Fig. d After adjustment
5	V BLK pulse width adjustment	White 100%	VR2202 [V]	Observe the signal of TP2208 (V BLK), and rotate and adjust TR2202 so that the pulse width of V BLK becomes 710 ± 20 us.
6	Synchronizing signal level adjustment	White 100%	R: VR2205 G: VR2204 B: VR2203	Observe TP2209(R), TP2210(G), TP2211(B), and set the levels of the horizontal sync sections to the video pedestal level (0IRE). 

No.	Adjustment items	Input signal	Section to be adjusted	Adjusting method
7	Screen voltage adjustment	Black (OIRE)	Screen VR [VR]	1. Set the Low Light side of sample pulse at J4103 of cathode side in the G CRT DRIVE assembly to DC 180V using G focus VR of Focus VR.  2. Adjust R (J4004 or TP4004) and B (J4203) focus VRs in the same adjustment as G, respectively.
8	X-ray protective circuit adjustment	White 100%	VR6006 [HV]	**Note :** Perform this adjustment only after the X-marked part is replaced. For the adjusting method, see Section "8.1.3 Adjusting The High Voltage Circuit".
9	Focus adjustment	Crosshatch	Focus of the lens assembly installed in the CRT assembly of the replaced color and of the focus variable resistor [VR]	● Move the lens assembly to the left and right to optimize the focus. ● Rotate the focus VR to optimize the focus. ● Repeat adjusting the lens assembly and focus VR. **Note :** Perform the following adjustment only after the blue focus is adjusted. Rotate the blue focus VR counterclockwise to slightly thicken the blue to a degree where the blue does not exceed the crosshatch on the screen. As a reference, rotate the focus VR by about 10 degrees.
10	Deflection yoke inclination adjustment	Monoscope or crosshatch	Position for installing the deflection yoke of the replaced color (left and right inclinations)	**Note :** Perform this adjustment after the CRT assembly or deflection yoke is replaced. ● Loosen the screws fixing the deflection yoke of the replaced color and match the inclinations of the vertical and horizontal lines at the center of the screen to those of one of the existing colors by rotating the yoke to the left and right. ● After adjustment, tighten the screws to fix the deflection yoke.
11	Screen center adjustment	Monoscope or crosshatch	Centering magnet of the deflection yoke of the replaced color	**Note :** Perform this adjustment to match the screen center point after the CRT assembly or deflection yoke is replaced. ● Move the centering magnet of the deflection yoke of the replaced color to match the vertical and horizontal lines at the center of the screen to those of one of the existing colors.

No.	Adjustment items	Input signal	Section to be adjusted	Adjusting method
12	ID assignment			Assigns the ID by the RS–232C command or Remote control unit.
13	White white balance, main deflection & convergence data and hour meter count number adjustment	—	—	Before exchange of the MICRO-COMPUTER assembly, read the following data (① to ③) and write them to the installed assembly after the exchange. ① White balance data, 6 ways ② Main deflection & convergence data, 4 ways ③ Hour meter count number
14	Main deflection & convergence adjustment	Crosshatch		● Compensate the green line so that the green crosshatch screen is normally displayed while only the green CRT drive assembly is operated. ● Compensate the red line so that it matches the green line on the crosshatch screen while the green and red CRT drive assemblies are operated. ● Compensate the blue line so that it matches the green line on the crosshatch screen while the green and blue CRT drive assemblies are operated. **Note :** For the detailed adjustment of the convergence, see Section "8.1.4 Main Deflection & Convergence Adjustment".
15	White balance adjustment	—	—	Install in the multi-screen and adjust according to the adjustment method shown in 8.3 After completion of the adjustment, memorize the standard setting.

8.1.3 Adjusting The High Voltage Circuit

- Observe safety precautions while working with high voltage.
- Be sure to work according to the procedures to prevent exposure to X-ray radiation.
- Prepare the VR tool before adjusting the X-ray protective circuit.

(a) Parts related to the high voltage circuit
(parts with an " x " mark in the service manual)

H. V & DEFLECTION (H. DEF) (BWV1041)	Adjustment required after replaced
T6004, VR6006, R6120, R6135, D6015	X-ray protective (＊1)
T6004, VR6004, R6071, R6087	High voltage circuit (＊1)

Note :

＊1 : Always adjust the X-ray protective circuit first after the flyback transformer (T6004) is replaced.

(b) Preparation before adjustment

- Before replacing the parts related to the high voltage circuit, remove the shield cover (ANH1166) enveloping the semi-fixed resistor (VR6004 and VR6006).

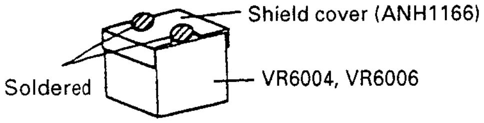


Fig. 8-2 Shielded Cover of the Semi-fixed Resistor

Note :

The semi-fixed resistors are covered with a glass tube.
Adjustment should be performed without removing the glass tube. Otherwise, the adjusted value can change when the glass tube is replaced.

■ Anode Cable Connection and Disconnection

Serviceman warning

> *Before removing the anode cable, turn off the power, unplug the AC plug and let the unit discharge for more than 1 minute.*

Disconnect the FBT anode cable as outlined in Fig. 8 - 3. Confirm the position of the rubber cover before disconnecting the cable, then it is easy connect the anode cable after the anode voltage is measured.

When connecting the anode cable, proceed in the reverse order as mentioned above. Confirm that the cable will not come off by pulling it after the cable is connected.

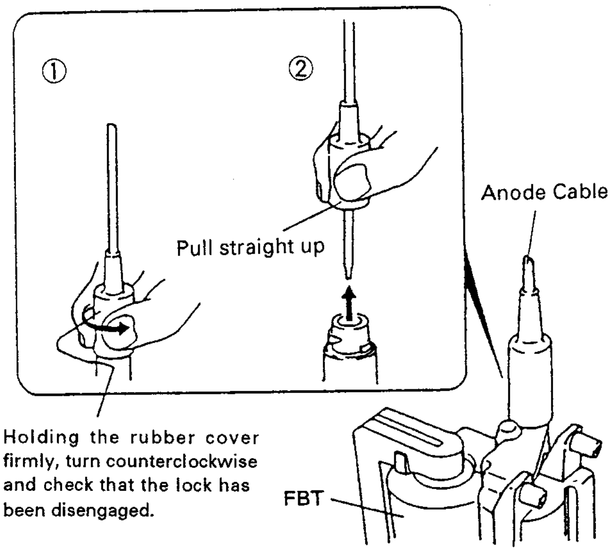

①
②
Pull straight up
Anode Cable
Holding the rubber cover firmly, turn counterclockwise and check that the lock has been disengaged.
FBT

Fig. 8-3 Disconnecting the Anode Cable

■ Connecting the High Voltage Meter (GGF–185) and High Voltage Distributor (GGF1011)

Connect the anode cable to the connector of the high voltage distributor, the same cable as the anode cable of the high voltage distributor to the FBT, and the high voltage probe of the high voltage meter (GGF–185) to the high voltage distributor.

Note :

Accurately connect the cables. Incomplete connection causes the FBT to be overloaded, so that excessively high voltage is generated at the FBT output. It is extremely dangerous.

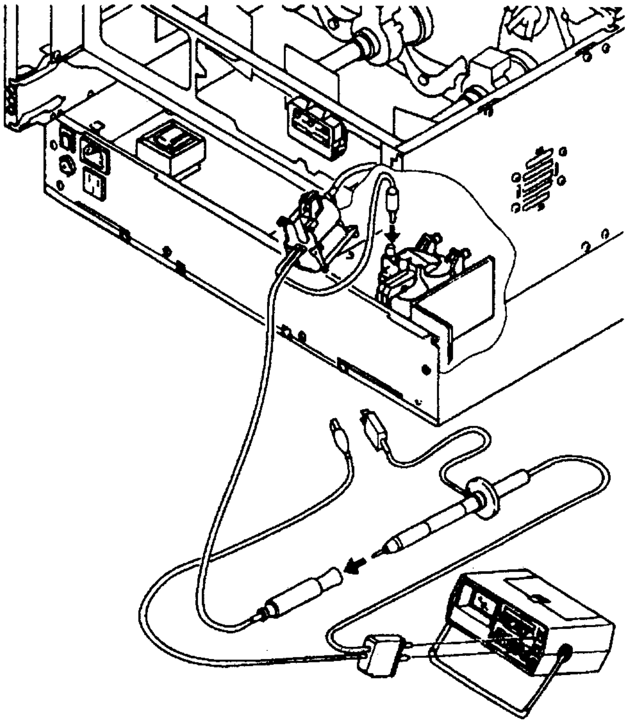


Fig. 8 - 4

■ Adjusting the X-ray Protective Circuit

1. Rotate VR of the VR tool decreasing the high voltage direction to the end, and connect the VR jig to TP6010 and TP6011 of the H. V & DEFLECTION assembly.

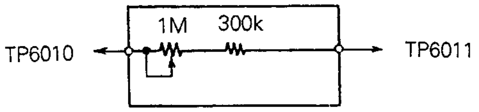


Fig. 8 - 5 VR Tool

2. Rotate VR6006 of the H. V & DEFLECTION assembly counterclockwise to the end.
3. Connect the AC power cord to the outlet and turn the power ON.
4. Input the white 100% (full-field) signal.
   Set to CONT 30.
5. Rotate VR of the tool to set the anode voltage (of the high voltage meter) to 33.5 kV.
6. Slowly rotate VR6006 clockwise, and stop where the X-ray protective circuit starts operating (the power is turned OFF).
7. Disconnect the AC power cord from the outlet, and wait for 10 seconds.
8. Rotate VR of the tool to previous position as the step 1.
9. Connect the AC power cord to the outlet, and turn the power ON.
10. Slowly rotate VR of the tool to set the high voltage meter value to 33.3 kV. Retain this value for about 10 seconds to confirm that the X-ray protective circuit does not operate. If it operates, restart the adjustment from Step 2.
11. Slowly rotate VR of the tool further to confirm that the X-ray protective circuit operates before the high voltage meter value reaches 33.8 kV. If it does not operate beyond 33.8 kV, restart the adjustment from Step 2.
12. Disconnect the AC power cord from the outlet, and remove the VR tool from the H. V & DEFLECTION assembly.
13. Return the CONT value to the original value.

■ Adjusting the High Voltage (Anode Voltage)

1. Rotate VR6004 of the H. V & DEFLECTION assembly counterclockwise to the end.
2. Input the black burst signal to the input terminal.
3. Connect the AC power cord to the outlet, and turn the power ON.
4. Confirm that the input selector corresponds to the input terminal to which the black burst signal is input.
5. Slowly rotate VR6004 clockwise to adjust the high voltage meter value to 30.5 kV ± 0.05 kV.
6. Turn the power off, and disconnect the AC power cord from the outlet.

■ Postprocessing

- Be sure to reinstall and solder the shield cover (ANH1166) of the semi-fixed resistor (VR6004 or VR6006) removed before adjustment.
- Remove the high voltage distributor, and confirm that the anode cable is correctly connected to the FBT if installed. (See Section " ■ Anode Cable Connection and Disconnection ")

8.1.4 Main Deflection & Convergence Adjustment

■ How to Enter the Adjustment Mode

Adjust in the adjustment mode.
Press the both "ADJ IN" key on the remote control unit (RU-V107).
Main menu appear on the screen after enter the adjustment mode.
Select the number, you can adjust each adjustment mode as below.

Key No.	Adustment Mode
3	Main deflection adjustment
4	Convergence adjustment
5	Point convergence adjustment

■ Adjusting the Main Deflection

The alphabetic characters displayed on the lower right of the screen indicate the types of main deflection adjustment.
To change the adjustment, press the numerical and alphabetical keys.
The display shows the set value under the main deflection adjustment type. To adjust the set value, use the ◁/– and +/▷ keys.

Key No.	Adjustment Type	Key No.	Adjustment Type
0	V. STATIC	7	H. BLK-L
2	V. SIZE	8	H. BLK-R
3	V. MID SIZE	9	V. MID LINEARITY
5	H. SIZE	B	H.PIN
6	V. LINEARITY	D	GH. LIN

Note : For the adjusting method, refer to 8.2.4 (2) Convergence adjustment flowchart.

■ Adjusting the convergence

- The alphabetic characters displayed on the lower right of the screen indicate the types of convergence. To change the convergence type, press the R ADJ, G ADJ and B ADJ keys of the remote control unit. The display shows the set value under the convergence type. To adjust the set value, use the ADJUST ◁/– and +/▷ keys.

- To display red, green and blue, use the remote control unit :

R ON/OFF key to ON/OFF .... Turns red color ON/OFF.
G ON/OFF key to ON/OFF .... Turns green color ON/OFF.
B ON/OFF key to ON/OFF .... Turns blue color ON/OFF.

Example :
To display only green color, press the R ON/OFF and B ON/OFF keys.

- Horizontal and Vertical Switching

The following will switch cyclically.

R ADJ .... RH ↔ RV
G ADJ .... GH ↔ GV
B ADJ .... BH ↔ BV

Note : Convergence adjustment can be performed in the point convergence adjustment mode as well.

Key	Adjustment Item
1	☆ STATIC
2	☆ SIZE ↓ MID SIZE ↓ 5D SIZE
3	☆ LIN ↓ MID LIN ↓ 6D SIZE
4	☆ SKEW ↓ 3D SKEW ↓ 5D SKEW
5	☆ KEY ↓ MID KEY ↓ 3D KEY ↓ MID 3D KEY
6	☆ KEY ↓ MID SUB KEY ↓ 3D SUB KEY ↓ M3D SUB KEY
7	☆ BOW ↓ 4D BOW ↓ 6D BOW
8	☆ PIN ↓ MID PIN ↓ 4D PIN ↓ M4D PIN
9	☆ SUB PIN ↓ MID SUB PIN ↓ 4D SUB PIN ↓ M4D SUB PIN

☆: Initial menu when selecting with 1 ~ 9 key.

1. Adjusting the Green Line

- As the green lines will be the reference line for red and blue, adjust accurately.
- Use the ADJUST ◁/– and +/▷ keys of the remote control unit to adjust the green lines.
- When all items are adjusted, perform fine adjustment by looking at the entire screen.
- Adjust convergence of the green lines by using green color only.

● Adjusting the horizontal distortion compensation for green

No.	Adjustment Item	Adjustment Method
1	GH - STATIC	Converge the green center and screen center. See Fig. 8-6.
2	GH - SKEW	Adjust the vertical green line in the center to a straight line. See Fig. 8-6.
3	GH - BOW	
4	GH - 3D SKEW	
5	GH - 4D BOW	
6	GH - 5D SKEW	
7	GH - 6D BOW	
8	Repeat steps 2 to 7.	
9	GH - SIZE	Equalize the intervals between vertical green lines at the center. See Fig. 8-6.
10	GH - LIN	
11	GH - MID SIZE	
12	GH - MID LIN	
13	GH - 5D SIZE	
14	GH - 6D LIN	
15	Repeat steps 9 to 14.	
16	GH - KEY	Adjust the vertical green lines at the top and bottom of the screen so that they do not incline. See Figs. 8-6 and 8-7.
17	GH - MID KEY (∗1)	
18	GH - SUB KEY	
19	GH - MID SUB KEY (∗1)	
20	Repeat steps 16 to 19.	
21	GH - 3D KEY	Adjust the vertical green lines at the top and bottom of the screen so that they become straight lines without distortion. See Figs. 8-6 and 8-7.B
22	GH - MID 3D KEY (∗1)	
23	GH - 3D SUB KEY	
24	GH - M3D SUB KEY (∗1)	
25	GH - PIN	
26	GH - MID PIN (∗1)	
27	GH - 4D PIN	
28	GH - M4D PIN (∗1)	
29	GH - SUB PIN	
30	GH - MID SUB PIN (∗1)	
31	GH - 4D SUB PIN	
32	GH - M4D SUB PIN (∗1)	
33	Repeat steps 21 to 32.	

Note :
∗1 : Adjust while observing the green vertical stripes shown on the left and right quarters od the screen.

- Adjusting the vertical destrotion compensation for green

No.	Adjustment Item	Adjustment Method
1	GV - STATIC	Converge the green center and screen center. See Fig. 8-6.
2	GV - SKEW	Adjust the horizontal green line in the center to a straight line. See Fig. 8-6.
3	GV - BOW	
4	GV - 3D SKEW	
5	GV - 4D BOW	
6	GV - 5D SKEW	
7	GV - 6D BOW	
8	Repeat steps 2 to 7.	
9	GV - SIZE	Equalize the intervals between horizontal green lines at the center. See Fig. 8-6.
10	GV - LIN	
11	GV - MID SIZE	
12	GV - MID LIN	
13	GV - 5D SIZE	
14	GV - 6D LIN	
15	Repeat steps 9 to 14.	
16	GV - KEY	Adjust the horizontal green lines at the top and bottom of the screen so that they do not incline. See Figs. 8-6 and 8-7.
17	GV - MID KEY (∗2)	
18	GV - SUB KEY	
19	GV - MID SUB KEY (∗2)	
20	Repeat steps 16 to 19.	
21	GV - 3D KEY	Adjust the horizontal green lines at the top and bottom of the screen so that they become straight lines without distortion. See Figs. 8-6 and 8-7.B
22	GV - MID 3D KEY (∗2)	
23	GV - 3D SUB KEY	
24	GV - M3D SUB KEY (∗2)	
25	GV - PIN	
26	GV - MID PIN (∗2)	
27	GV - 4D PIN	
28	GV - M4D PIN (∗2)	
29	GV - SUB PIN	
30	GV - MID SUB PIN (∗2)	
31	GV - 4D SUB PIN	
32	GV - M4D SUB PIN (∗2)	
33	Repeat steps 21 to 32.	

Note :

∗2 : Adjust while observing the green horizontal stripes shown on the left and right quarters od the screen.

2. Adjusting the Red Line

- Perfrom convergence adjustment for red lines by using green and red lines.
- Use the ADJUST ◁/− and +/▷ keys of the remote control unit to overlap red and green lines adjust the overlapped portionto yellow color.
- When all items are adjusted, perform fine adjustment by looking at the entire screen.

- Adjusting the horizontal distortion compensation for green

No.	Adjustment Item	Adjustment Method
1	RH - STATIC	Converge the center of red in the center of green. See Fig. 8-6.
2	RH - SKEW	Adjust the vertical red line in the center of overlap with the vertical green lines. See Fig. 8-6.
3	RH - BOW	
4	RH - 3D SKEW	
5	RH - 4D BOW	
6	RH - 5D SKEW	
7	RH - 6D BOW	
8	Repeat steps 2 to 7.	
9	RH - SIZE	Adjust intervals of the vertical red lines to the central intervals of the vertical green lines. See Fig. 8-6.
10	RH - LIN	
11	RH - MID SIZE	
12	RH - MID LIN	
13	RH - 5D SIZE	
14	RH - 6D LIN	
15	Repeat steps 9 to 14.	
16	RH - KEY	Adjust the vertical red lines so that they become vertical straight lines without inclination. See Figs. 8-6 and 8-7.
17	RH - MID KEY (*3)	
18	RH - SUB KEY	
19	RH - MID SUB KEY (*3)	
20	Repeat steps 16 to 19.	
21	RH - 3D KEY	Adjust the vertical red lines to overlap the vertical green lines at the top and bottom of the screen so that they become straight lines without distortion. See Figs. 8-6 and 8-7.
22	RH - MID 3D KEY (*3)	
23	RH - 3D SUB KEY	
24	RH - M3D SUB KEY (*3)	
25	RH - PIN	
26	RH - MID PIN (*3)	
27	RH - 4D PIN	
28	RH - M4D PIN (*3)	
29	RH - SUB PIN	
30	RH - MID SUB PIN (*3)	
31	RH - 4D SUB PIN	
32	RH - M4D SUB PIN (*3)	
33	Repeat steps 21 to 32.	

Note :
**3 : Adjust while observing the red vertical stripes shown on the left and right quarters od the screen.*

- Adjusting the vertical distortion compensation fro red

No.	Adjustment Item	Adjustment Method
1	RV - STATIC	Converge the center of red in the center of green. See Fig. 8-6.
2	RV - SKEW	Adjust the horizontal red line in the center of overlap with the horizontal green lines. See Fig. 8-6.
3	RV - BOW	
4	RV - 3D SKEW	
5	RV - 4D BOW	
6	RV - 5D SKEW	
7	RV - 6D BOW	
8	Repeat steps 2 to 7.	
9	RV - SIZE	Adjust intervals of the horizontal red lines to the central intervals of the horizontal green lines. See Fig. 8-6.
10	RV - LIN	
11	RV - MID SIZE	
12	RV - MID LIN	
13	RV - 5D SIZE	
14	RV - 6D LIN	
15	Repeat steps 9 to 14.	
16	RV - KEY	Adjust the horizontal red lines so that they become horizontal straight lines without inclination. See Figs. 8-6 and 8-7.
17	RV - MID KEY (*4)	
18	RV - SUB KEY	
19	RV - MID SUB KEY (*4)	
20	Repeat steps 16 to 19.	
21	RV - 3D KEY	Adjust the horizontal red lines to overlap the horizontal green lines at the top and bottom of the screen so that they become straight lines without distortion. See Figs. 8-6 and 8-7.B
22	RV - MID 3D KEY (*4)	
23	RV - 3D SUB KEY	
24	RV - M3D SUB KEY (*4)	
25	RV - PIN	
26	RV - MID PIN (*4)	
27	RV - 4D PIN	
28	RV - M4D PIN (*4)	
29	RV - SUB PIN	
30	RV - MID SUB PIN (*4)	
31	RV - 4D SUB PIN	
32	RV - M4D SUB PIN (*4)	
33	Repeat steps 21 to 32.	

Note :
**4 : Adjust while observing the red vertical stripes shown on the left and right quarters od the screen.*

3. Adjusting the Blue Line

- Perfrom convergence adjustment for blue lines by using green and blue lines.
- Use the ADJUST [◁/–] and [+/▷] keys of the remote control unit to overlap red and green lines adjust the overlapped portionto yellow color.
- When all items are adjusted, perform fine adjustment by looking at the entire screen.

- Adjusting the horizontal distortion compensation for green

No.	Adjustment Item	Adjustment Method
1	BH - STATIC	Converge the center of blue in the center of green. See Fig. 8-6.
2	BH - SKEW	Adjust the vertical blue line in the center of overlap with the vertical green lines. See Fig. 8-6.
3	BH - BOW	
4	BH - 3D SKEW	
5	BH - 4D BOW	
6	BH - 5D SKEW	
7	BH - 6D BOW	
8	Repeat steps 2 to 7.	
9	BH - SIZE	Adjust intervals of the vertical blue lines to the central intervals of the vertical green lines. See Fig. 8-6.
10	BH - LIN	
11	BH - MID SIZE	
12	BH - MID LIN	
13	BH - 5D SIZE	
14	BH - 6D LIN	
15	Repeat steps 9 to 14.	
16	BH - KEY	Adjust the vertical blue lines so that they become vertical straight lines without inclination. See Figs. 8-6 and 8-7.
17	BH - MID KEY (∗5)	
18	BH - SUB KEY	
19	BH - MID SUB KEY (∗5)	
20	Repeat steps 16 to 19.	
21	BH - 3D KEY	Adjust the vertical blue lines to overlap the vertical green lines at the top and bottom of the screen so that they become straight lines without distortion. See Figs. 8-6 and 8-7.
22	BH - MID 3D KEY (∗5)	
23	BH - 3D SUB KEY	
24	BH - M3D SUB KEY (∗5)	
25	BH - PIN	
26	BH - MID PIN (∗5)	
27	BH - 4D PIN	
28	BH - M4D PIN (∗5)	
29	BH - SUB PIN	
30	BH - MID SUB PIN (∗5)	
31	BH - 4D SUB PIN	
32	BH - M4D SUB PIN (∗5)	
33	Repeat steps 21 to 32.	

Note :

∗5 : Adjust while observing the blue vertical stripes shown on the left and right quarters od the screen.

- Adjustinbg the vertical distortion compesation for blue

No.	Adjustment Item	Adjustment Method
1	BV - STATIC	Converge the center of blue in the center of green. See Fig. 8-6.
2	BV - SKEW	Adjust the horizontal blue line in the center of overlap with the horizontal green lines. See Fig. 8-6.
3	BV - BOW	
4	BV - 3D SKEW	
5	BV - 4D BOW	
6	BV - 5D SKEW	
7	BV - 6D BOW	
8	Repeat steps 2 to 7.	
9	BV - SIZE	Adjust intervals of the horizontal blue lines to the central intervals of the horizontal green lines. See Fig. 8-6.
10	BV - LIN	
11	BV - MID SIZE	
12	BV - MID LIN	
13	BV - 5D SIZE	
14	BV - 6D LIN	
15	Repeat steps 9 to 14.	
16	BV - KEY	Adjust the horizontal blue lines so that they become horizontal straight lines without inclination. See Figs. 8-6 and 8-7.
17	BV - MID KEY (∗6)	
18	BV - SUB KEY	
19	BV - MID SUB KEY (∗6)	
20	Repeat steps 16 to 19.	
21	BV - 3D KEY	Adjust the horizontal blue lines to overlap the horizontal green lines at the top and bottom of the screen so that they become straight lines without distortion. See Figs. 8-6 and 8-7.B
22	BV - MID 3D KEY (∗6)	
23	BV - 3D SUB KEY	
24	BV - M3D SUB KEY (∗6)	
25	BV - PIN	
26	BV - MID PIN (∗6)	
27	BV - 4D PIN	
28	BV - M4D PIN (∗6)	
29	BV - SUB PIN	
30	BV - MID SUB PIN (∗6)	
31	BV - 4D SUB PIN	
32	BV - M4D SUB PIN (∗6)	
33	Repeat steps 21 to 32.	

Note :
∗6 : Adjust while observing the red vertical stripes shown on the left and right quarters od the screen.

■ Manual Convergence Adjustment
(Vertical direction)

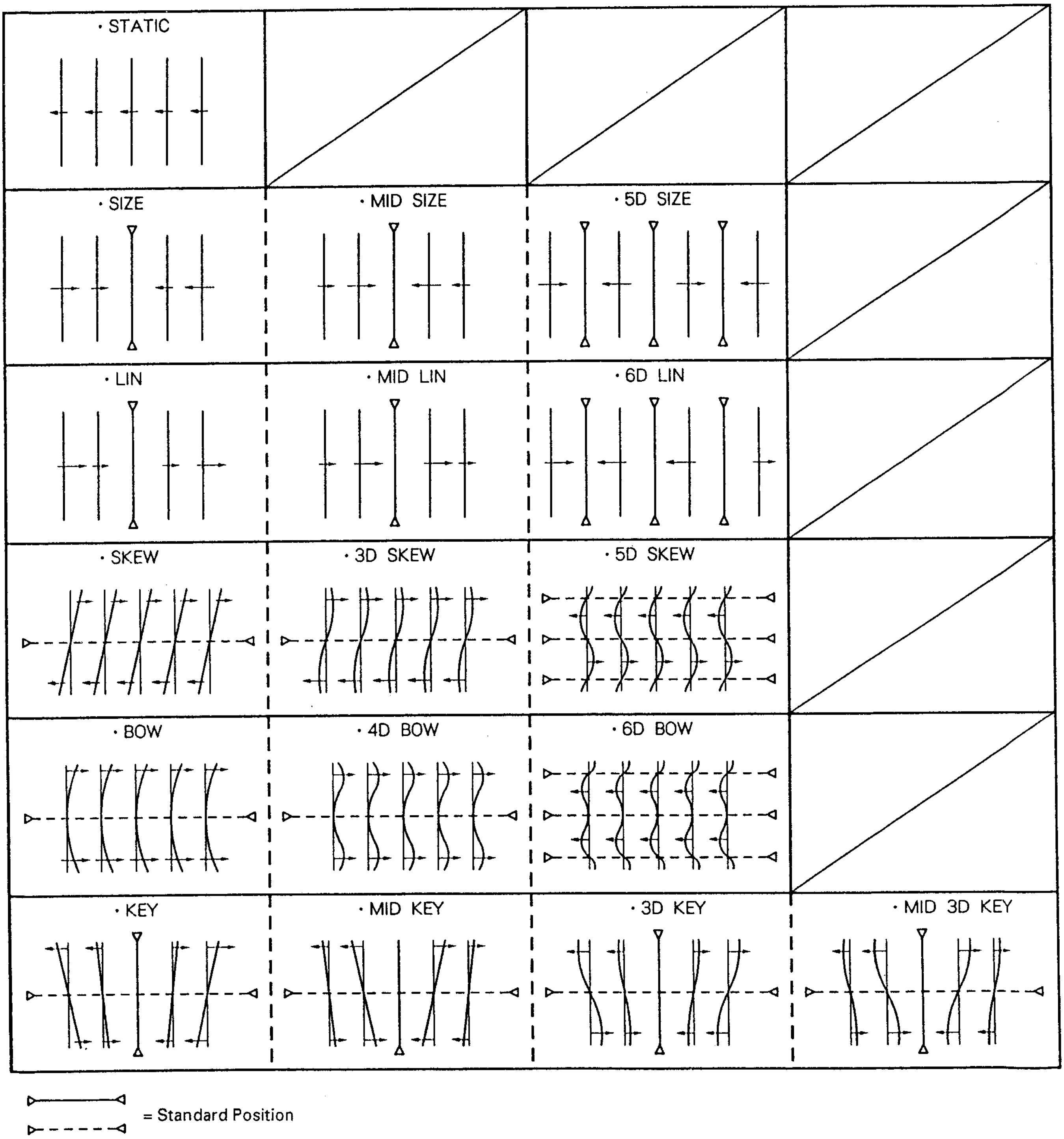

· STATIC
· SIZE
· MID SIZE
· 5D SIZE
· LIN
· MID LIN
· 6D LIN
· SKEW
· 3D SKEW
· 5D SKEW
· BOW
· 4D BOW
· 6D BOW
· KEY
· MID KEY
· 3D KEY
· MID 3D KEY
= Standard Position

Fig. 8-6 Horizontal Compensation Adjustment (1)

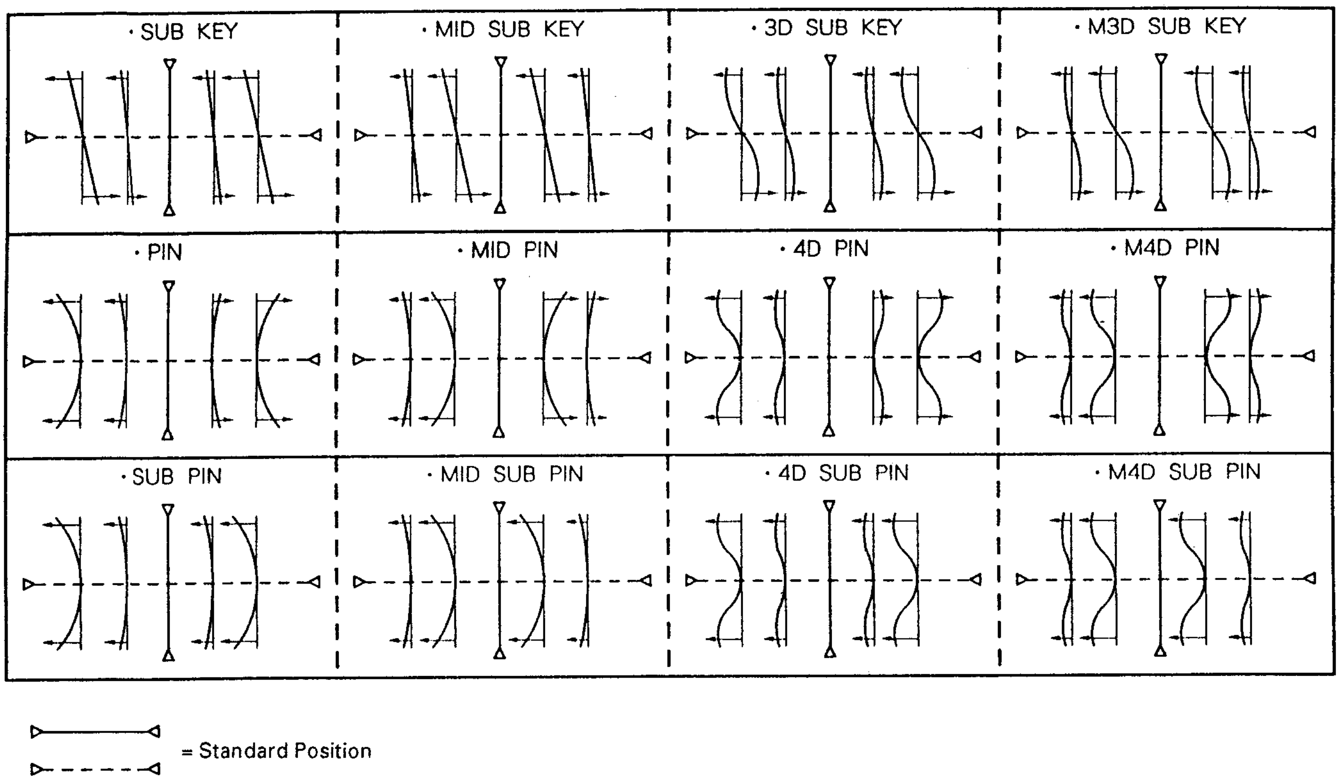
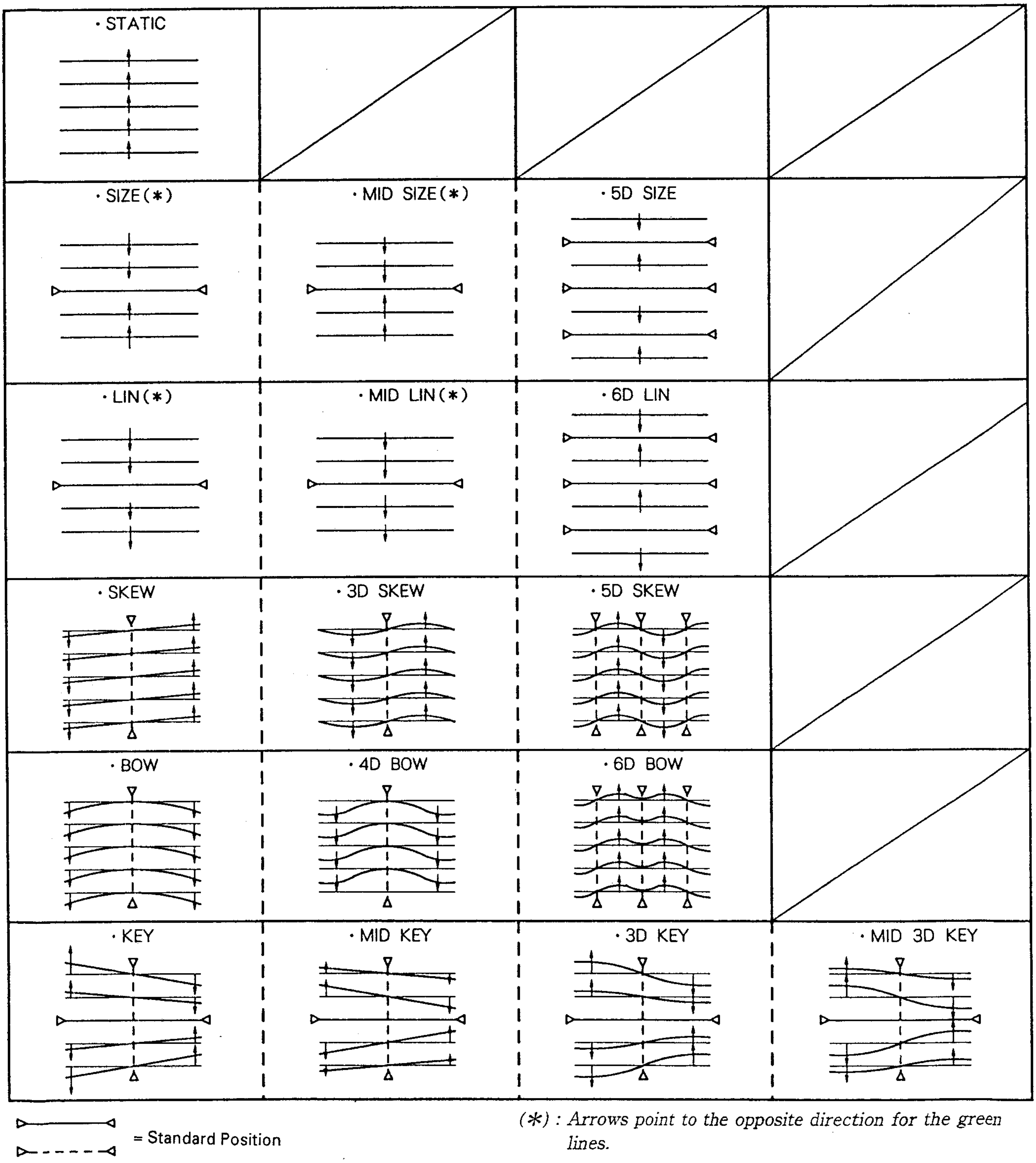

· SUB KEY
· MID SUB KEY
· 3D SUB KEY
· M3D SUB KEY
· PIN
· MID PIN
· 4D PIN
· M4D PIN
· SUB PIN
· MID SUB PIN
· 4D SUB PIN
· M4D SUB PIN
= Standard Position

Fig. 8-7 Horizontal Compensation Adjustment (2)

Manual Convergence Adjustment (Horizontal direction)


• STATIC
• SIZE(*)
• MID SIZE(*)
• 5D SIZE
• LIN(*)
• MID LIN(*)
• 6D LIN
• SKEW
• 3D SKEW
• 5D SKEW
• BOW
• 4D BOW
• 6D BOW
• KEY
• MID KEY
• 3D KEY
• MID 3D KEY
= Standard Position

(*) : Arrows point to the opposite direction for the green lines.

Fig. 8-8 Horizontal Compensation Adjustment (1)

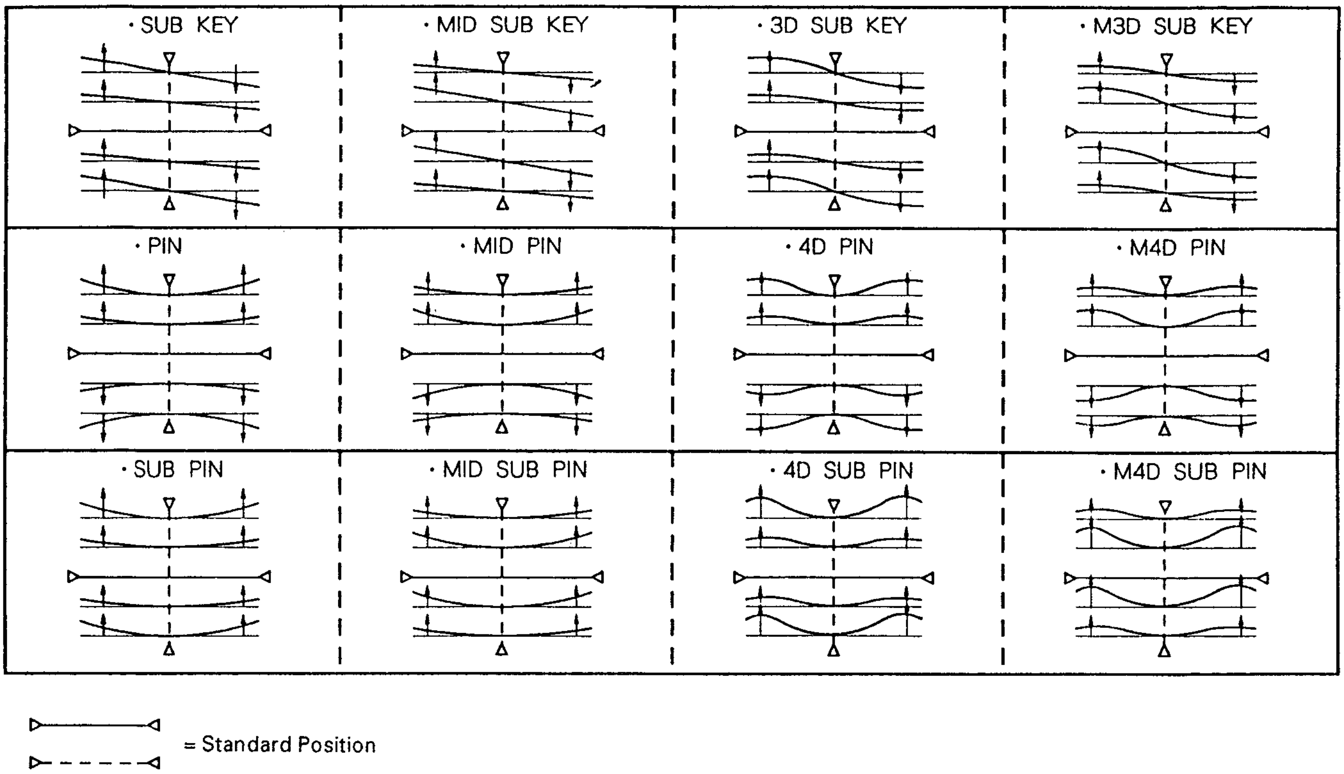

· SUB KEY
· MID SUB KEY
· 3D SUB KEY
· M3D SUB KEY
· PIN
· MID PIN
· 4D PIN
· M4D PIN
· SUB PIN
· MID SUB PIN
· 4D SUB PIN
· M4D SUB PIN
= Standard Position

Fig. 8-9 Vertical Compesation Adjustment (2)

CONTROL ASSY

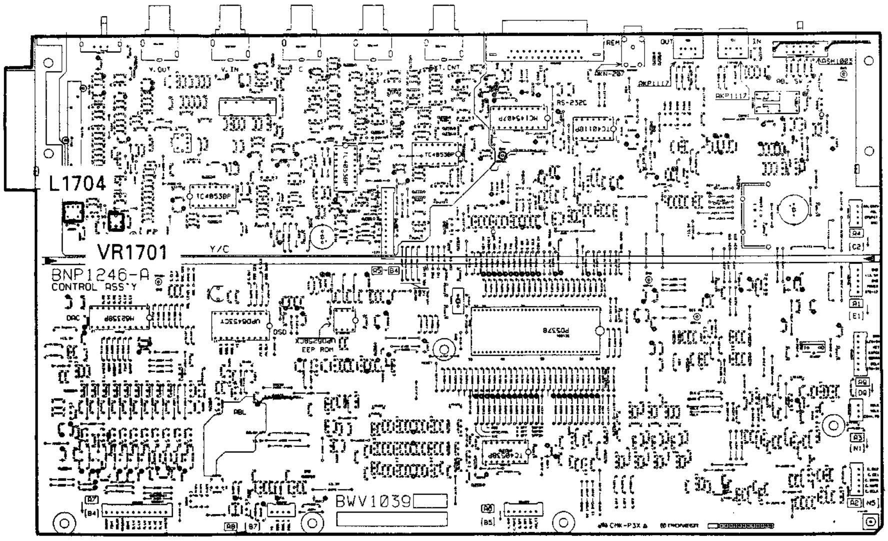
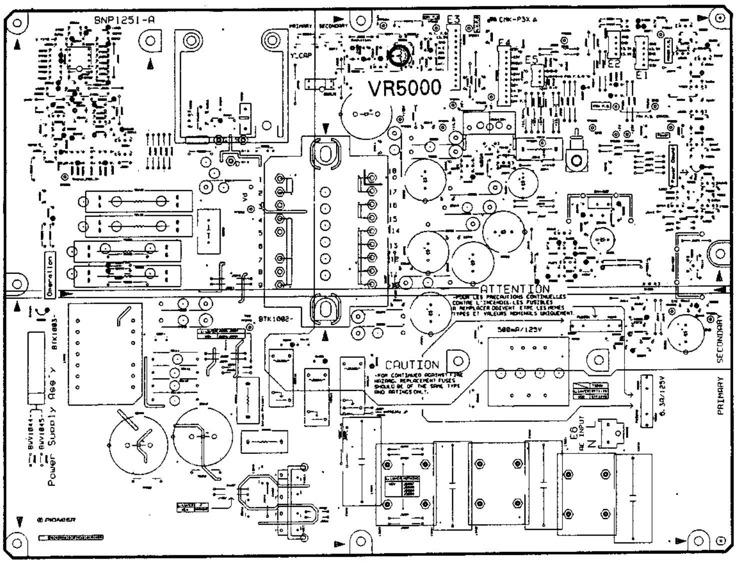
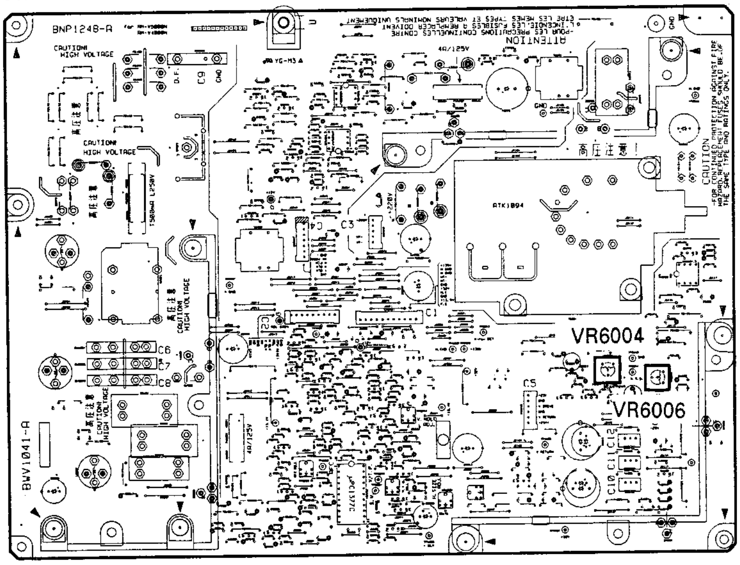

L1704
VR1701
BNP1246-A
CONTROL ASS'Y
BWV1039

Fig. 8-10 Adjustment point

POWER ASSY


BNP1251-A
VR5000
ATTENTION
CAUTION
500mA/125V
BTK1002
PRIMARY
SECONDARY
Power Supply Ass'y

H.V & DEFLECTION ASSY


BNP1248-A
CAUTION HIGH VOLTAGE
ATTENTION
4A/125V
BTK1004
C1
C3
C5
VR6004
VR6006
BWV1041-A

VIDEO ASSY

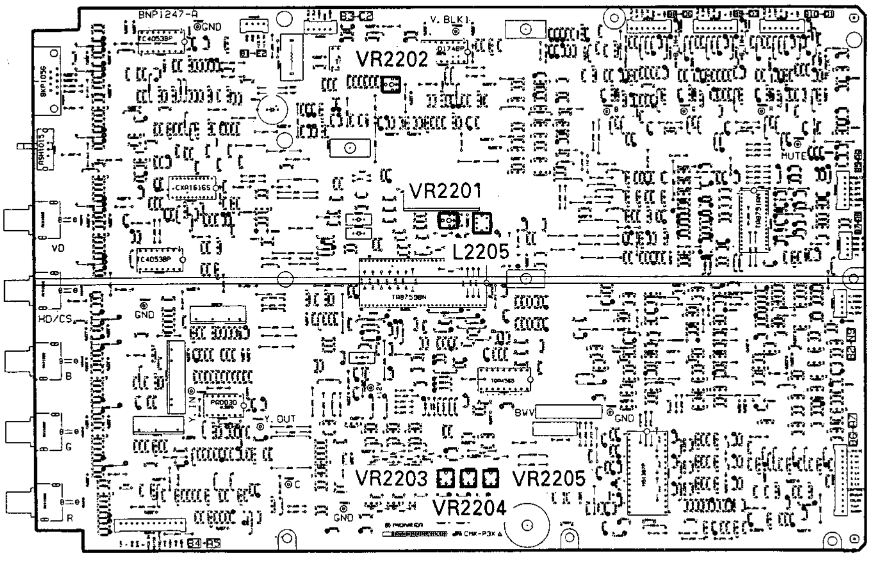

BNP1247-A
GND
V.BLK1
VR2202
VR2201
L2205
MUTE
VD
HD/CS
B
G
R
Y.OUT
BWV
VR2203
VR2205
VR2204

Fig. 8-11 Adjustment point

8.2 POINT CONVERGENCE ADJUSTMENT MODE

「 」 is displayed at the center of the screen. This indicates the point to be adjusted, and it is moved left/right and up/down with the keys [2], [4], [6], and [8]. Further, for adjustment of the convergence of that point, adjustment is made with [△], [▽], [◁/-] and [+/▷].
Red, green, or blue can be selected as the adjustment color by pressing [R ON/OFF], [G ON/OFF], or [B ON/OFF].

- **Output method for red, green, and blue as single colors to use the remote control unit.**

[R ON/OFF] key to ON/OFF .... Turns red color ON/OFF.
[G ON/OFF] key to ON/OFF .... Turns green color ON/OFF.
[B ON/OFF] key to ON/OFF .... Turns blue color ON/OFF.

8.2.1 ADJUSTMENT PREPARATIONS

(1) Wiring

① Connection of Power Supply

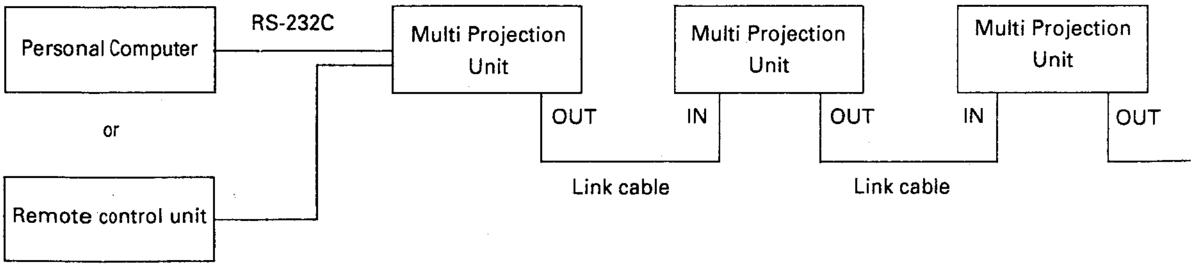
- The power supply can be connected to up to 3 units in a series using the AC outlets of Multi projection units. Connect the three units as one system to the external outlet.
- The AC plug of Multi projection unit is a 3P with a ground pin. When connecting it to a normal outlet, use an exclusive 3P AC adapter.
- The AC plug of Multi projection unit is a 3P with a ground pin. To prevent electric shocks, connect the ground pin to the ground when connecting the power supply.

② Connection of signal cable

- Use coaxial cables. Normally, if less than 15m, use 3C-2V. If less than 30m, use 5C-2V.
The signal transmission equipment and Multi projection units should be as close as possible to each other.

③ Connection of ABL link cable

- By connecting the ABL link cables in cascade form, control signals (RS-232C, remote control signal) can be transmitted to all the units.



(Up to 16 units can be operated using the remote control unit at one time using the link cable.)

(2) Wiring Handling

- Except for short-term installations such as events, etc., in normal long-term installations, adjust the length of the wiring appropriately taking into consideration the overall route to be wired.
- Make sure the connection terminals are not subjected to direct weight and force. Tie the wires up in short-term use and bind them up properly in long-term use.

(3) Aging

- After turning on the power, input the 100% white signal or moving images, and perform aging until Multi projection unit stabilizes (about 1 hour). If adjustments are performed without aging, as it takes time until Multi projection unit will warm up and stabilize, convergence and white balance will become incorrect.

(4) Adjustment Signals

- Use the composite video signal for adjustments created in the multi video processor. When converters not creating the signals for adjustment are used, supply the signals for adjustment from equivalent signal sources (signal generator, LD player, etc.)

◎Generally Required Signals

Adjustment	Signal Name
• Screen center Screen size adjustment	Monoscope
• Convergence adjustment	Crosshatch Tilted crosshatch
• White balance adjustment	White signal (Can be linearly varied between 0% and 100%) Or window step
• Linear white adjustment	Crosshatch
• Total adjustment (Color, tint, etc.)	Moving image (scenery, faces) Color-bar, etc.

(5) Equipment Required for Adjustments

The following are required for the adjustments performed during the set-up of Multi projection unit.

Equipment	Role	Required Function	Recommended Model	Remarks
Personal Computer	For adjusting	RS232C communication function		
Adjusting remote control	For adjusting		Pioneer RU-V107	Prepare a Personal Computer or this remote control for adjustment.
Signal generator	For generating white balance and color tint adjusting signals	Gray scale White (% variable)		Especially white (% variable) is important. (Cannot replace with LD, etc.) Use signal generators of this class at the least.
Adjusting LD	Total image quality adjustment	High definition image Picture of beauty Various adjustment signals	LD demonstration 2 (Not for sale)	Perform color, or final and overall adjustments with the actual images.
LD player	For playing adjusting LD	With still function	Pioneer LD-V4400	
Cable	For connecting RS-232C	D-Sub 25-pin (male) straight cable		The length differs according to the place adjustment is performed at, but prepare at least 10 m.
	For connecting video			
Adjusting LD	For generating signals for adjusting size, convergence	Monoscope Crosshatch	Test disc GGT 1072	Use for adjusting screen size and center.

8.2.2 BEFORE ADJUSTMENTS

(1) Convergence Adjustment Memory

The multi projection unit incorporates four convergence adjustment memories. These can broadly be divided into the adjustable memory (Memories 1 to 3) and dedicated memory for reading adjustment values set at shipment (FACTORY).

Memory Area / Input Signal	1	2	3	FACTORY
NTSC	○	○	○	◎
PAL	○	○	○	◎

○ : Enable to select.
◎ : Disable to select. Only possible to read out to the memory area enable to select.

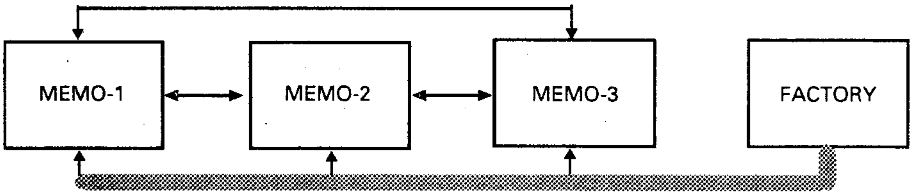
The following adjustment data are input to each memory area at shipment.

MEMO-1	: For NTSC signals
MEMO-2	: For PAL signals
MEMO-3	: For NTSC signals (Same data as MEMO-1) -------- For PAL signals(Same data as MEMO-2)
FACTORY	: For NTSC signals (Same data as MEMO-1) -------- For PAL signals(Same data as MEMO-2)

For some input signals, NTSC and PAL are selected automatically.
When a NTSC signal is input : MEMO-1
When a PAL signal is input : MEMO-2

Copying the Convergence Memory

The convergence memory can be copied by the remote control unit or PC. (See figure below.)



When data is copied, the memory into which the data is copied will lose its original data. (For example, when data is copied from MEMO-1 to MEMO-2, MEMO-2 will becomes the memory for the NTSC signal, and lose the PAL signal.)

When the data has been copied into the selected convergence memory area, this can be known by the display [COPY END] on the screen. In that case, the data of the convergence has been changed into new data. If the data is not same,the convergence will change as well.

Example : When MEMO-1 is selected
MEMO-1 → Copy to other memories: Completed when [COPY END] is displayed on the screen.
MEMO-1 ← Copy to other memories: Completed when [COPY END] is displayed on the screen and at the same time convergence deviates.

Condition : MEMO-1 data $\neq$ MEMO-2 data

(2) TV System

The TV system determines the control of the whole unit (convergence, OSD display select, video system select, deflection) according to the signal·input.
Set it according to the signal input.

When TV SYSTEM is set to AUTO
- The mode is automatically set to NTSC or PAL according to the input signal (NTSC/PAL).

When the TV SYSTEM is set to NTSC
- The mode is set to NTSC regardless of the input signal.

When the TV SYSTEM is set to PAL
- The mode is set to PAL regardless of the input signal.

[Precaution to use]

Normally, the TV SYSTEM is set to AUTO. If the signals cannot be differentiated between NTSC and PAL (or they are differentiated incorrectly : VTR signal repeatedly dubbed or part of CATV converter, etc.), the TV SYSTEM is set to NTSC or PAL according to the input signal.

When the input signal is NTSC or PAL, and the TV SYSTEM is set to NTSC or PAL, it can enable the input to be switched smoothly (little screen noises), and prevent signals from being differentiated incorrectly due to signal disturbances and cuts.

In some cases, even if the same TV format is used, more than two types of convergence data will be required. (For example, when there are signal phase differences for every input source, etc.) In such cases, use two types of memories. Switch them using the personal computer.

(3) White Balance Adjustment Memory

ADJUSTMENTS has altogether six white balance adjustment memories.

Color mode 1 (Normal)	VIDEO, Y/C input memory
	RGB input memory
	Factory shipment memory

Color mode 2 (Re-expose)	VIDEO, Y/C input memory
	RGB input memory
	Factory shipment memory

Four memories can be actually adjusted except the factory shipment memory. The factory shipment memory contains the normal white balance adjustment data and re-expose white balance adjustment data.
By setting to color mode 1 using the rear panel switch, etc., the white balance adjustment data can be switched by synchronizing with input switching. This is the same for color mode 2. If it is necessary to change color mode 1 and 2 in the same input function or VIDEO , Y/C input, connect the PC and switch each time by command(CM1,CM2).

(4) Combined Use of Remote Control and Personal Computer

Although it is possible to connect both the remote control (RU-V107) and Personal Computer, adjustments cannot be performed using both at the same time.
Remote control, Personal Computer commands and rear panel switches operated the latest are given priority. When the adjustment mode is set by the Personal Computer while adjusting with the remote control, the adjustment mode will be set by the Personal Computer, disabling adjustments to be performed using the remote control. If the adjustment mode is set by the remote control using adjustments by the Personal Computer, adjustments by the Personal Computer will be disabled. Furthermore, if the rear panel switches are operated when the adjustment mode is set by the remote control or Personal Computer, the adjustment mode is exited and the rear panel switches operations are started.

(5) Memory of Adjustment Data and Settings

When adjustments are ended in the adjustment mode such as convergence, white balance, etc., always exit the adjustment mode (AJN for Personal Computer, ADJ OUT key for remote control). If the power is turned off (AC OFF) without exiting the adjustment mode, a part of the adjustment data will not be preserved in the memory.
The input function, MULTI ON/OFF (peripheral light amount switching), COLOR MODE 1/2 (white balance switching), COMBINATION ON/OFF (ABL link switching), VIDEO MUTE ON/OFF (VIDEO MUTE of input switching), baud rate setting, TV SYSTEM setting, and convergence memory state setting will be preserved in the memory only when the power is turned off using the remote control, command of a Personal Computer (POF) or the rear panel tact switch, and finish the adjustment mode (when you set each data in the adjustment mode.) (The Main Power SW ON/OFF or AC ON/OFF by the external SW will not allow data to be preserved in the memory.)
When starting or stopping the system by AC ON/OFF in an installation condition for demonstration, use this method to preserve the conditions in the memory first and confirm the initial condition by AC ON/OFF.

The following phenomena may occur when discharge occurs.
Example : During performance in which inputs are switched using the personal computer (VIDEO ⇔ RGB)
When discharge occurs, RGB is switched to VIDEO.

This phenomenon occurs because at the same time discharge occurs, the INPUT set is initialized in the previous memorized state (in this example, it is the VIDEO input). Therefore pay careful attention when using the memory.

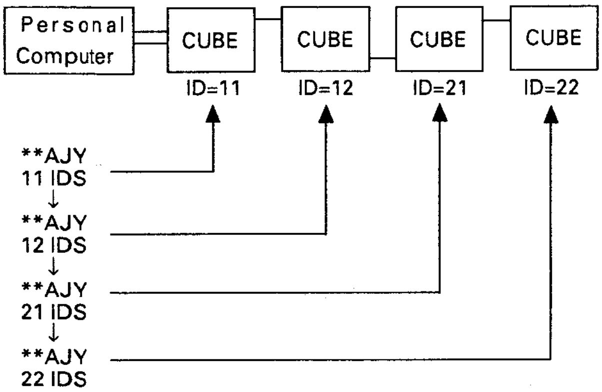
(6) Giving IDs

When several Multi projection units are used to compose the 9 screens or 16 screens (multi-screen), the ID is used to differentiate between Multi projection units. When the units are given IDs, by connecting the ABL link cable, commands can be transmitted by specifying the ID, and it is possible to operate only Multi projection unit corresponding to that ID by remote control operations.

<Giving IDs using Personal Computer>

Commands: IDC (IDC CLEAR) ;Clears the ID given
IDS (ID SET) ;Gives an ID
The IDS is valid only when no ID has been given. It will be valid from units nearest to the personal computer (remote control).

(Example) 4 screens • When giving IDs first using Personal Computer.



By sending commands in this order, IDs can be given to each Multi Projection Unit (connect ABL link cables as above example).

The characters that can be used for the IDs are 0 to 9 and A to F, and * (capital and small letters are not differentiated).
The * can be used in the following way.

** IDC	:Clears IDs given to all units
*1AJY	:Only units which have IDs whose 2nd digit is 1 enter the adjustment mode.
2* IN1	:The input function of only units which have IDs whose 1st digit is 2 is set to VIDEO.

<Giving IDs Using the Remote Control>

[1] Press the ADJ IN key to set the whole screen into the adjustment mode.
[2] The main menu will be displayed. Press the 1 key.
Select "1. ID SET/CLEAR/SELECT"
[3] Check that the ID display at the top left of the screen is "– –" and press the 1 key.
Select "1.ID SET".
If an ID has already been given, press the 0 key, select "0. ID CLEAR" of the main menu, return to "[1] Enter the adjustment mode." and give the ID.
[4] As the ID input standby state is set, press the 0 to 9, A to F keys, and input the ID.
[5] To use the multi-screen unit, return to "[1] Enter the adjustment mode." and given an ID to the next unit.

Note) To return the whole screen to the main menu after giving IDs to the whole screen, press the ADJ IN key.

<Selecting the ID Using the Remote Control>
Select the screen to be adjusted using the remote control.
Example) Select the ID at the bottom left side of the screen (ID=21) as shown in the figure below.

[1] Set all screens to the adjustment mode using the ADJ IN key .
[2] Select [1. ID SET/CLEAR/SELECT using the 1 key.
[3] Select [2. ID SELECT] using the 2 key.
[4] Press the 2 and 1 keys (ID=21).
[5] Only the bottom left side of the screen shows the main menu. The other screens will set into the standby state (POWER , ADJ IN , ADJ OUT keys only are accepted).

ID = 11	ID = 12
ID = 21	ID = 22

- To return to the main menu after completing ID SELECT, press the [MAIN MENU] key to keep the ID SELECT state.

  Pressing the [ADJ IN] key will also return to the main menu, but it also clear the ID SELECT state, making it necessary to repeat from step [1] again.

  To select other screens, press the [MAIN MENU] key to return to the main menu, and change the ID number set at step [4] above.

Note : When the wrong ID has been specified
Repeat the above steps [1] to [5].
Perform the same steps when an inappropriate ID (Example : ID=33, etc. in the above screen) has been input. In this case, all screens will set into the standby state.

<Precautions for Giving IDs using the Remote Control and Personal Computer>

Communication cannot be performed with units connected using the ABL link cable, after units whose IDs have been cleared. When the command "** IDC" shown in the figure on the previous page is performed, only the first unit can be controlled. Using the command "11 IDS" will enable the 2nd unit and onwards to be controlled.
When IDs are set as this, the unit connected next can be controlled.

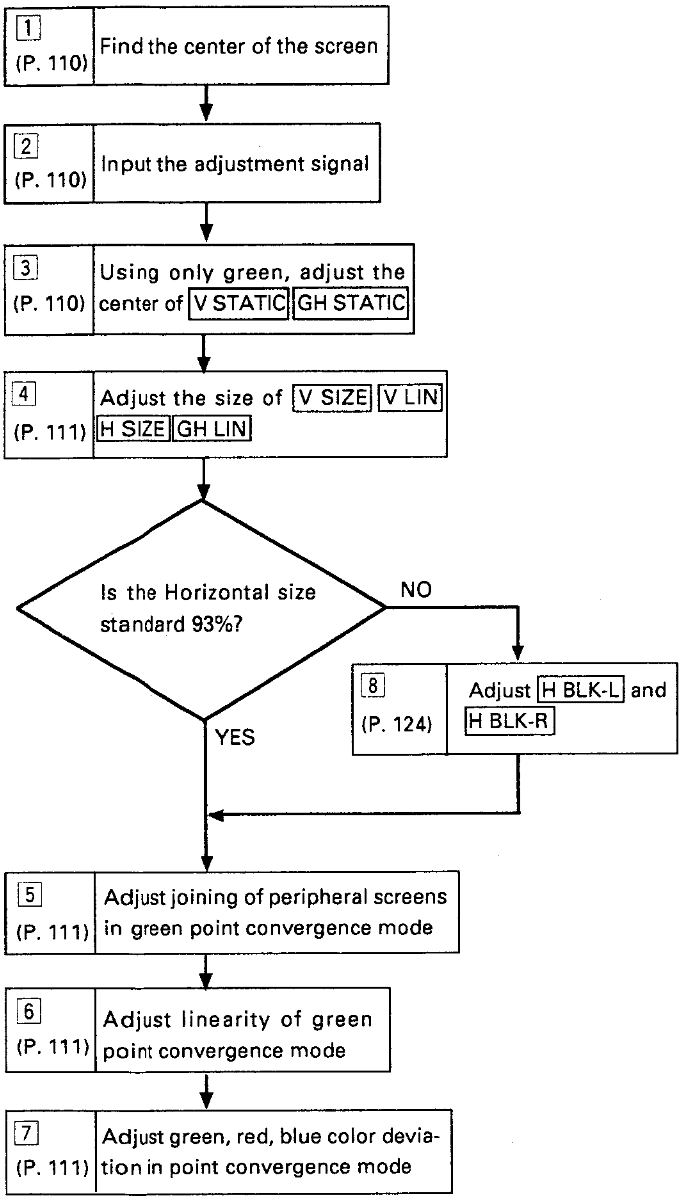
8.2.3 SCREEN ADJUSTMENTS

(1) Adjustment Flowchart

The following shows the order for performing the adjustments generally required in the setup of the multi-projection system.
For details, see the descriptions on the next page and later.

① Give ID
↓
② Adjust the size of each screen
↓
③ Adjust the convergence of each screen
↓
④ Adjust the joining of the screens
(Adjust with the multi-video processor)
↓
⑤ Check that there is no information missing and color deviation on the moving image.
If information is missing or color has deviated, return to ② and readjust.
↓
⑥ Adjust the white balance of each screen.
↓
⑦ Adjust the ABL level
↓
⑧ Check the ABL level and white balance using the video actually transmitted.
If there is deviation, return to ⑥ and readjust
↓
⑨ Adjust the color tone using the video actually transmitted.
↓
⑩ Recheck ⑥ to ⑧

(2) Convergence Adjustment Flowchart

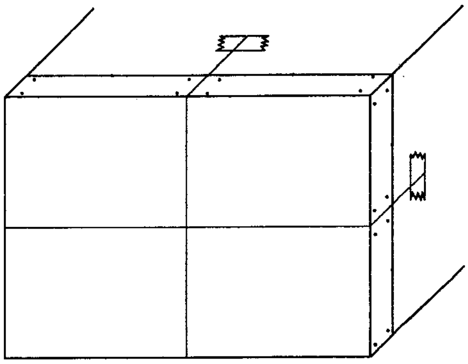

1 (P. 110) Find the center of the screen
2 (P. 110) Input the adjustment signal
3 (P. 110) Using only green, adjust the center of V STATIC GH STATIC
4 (P. 111) Adjust the size of V SIZE V LIN H SIZE GH LIN
Is the Horizontal size standard 93%?
NO
YES
8 (P. 124) Adjust H BLK-L and H BLK-R
5 (P. 111) Adjust joining of peripheral screens in green point convergence mode
6 (P. 111) Adjust linearity of green point convergence mode
7 (P. 111) Adjust green, red, blue color deviation in point convergence mode

(3) Convergence Adjustment Contents

1 Measurement of screen center

The center can be found easily by pasting threads in the spaces of the protection panels at the screen frame.

The □ numbers correspond to the numbers in the flowchart.



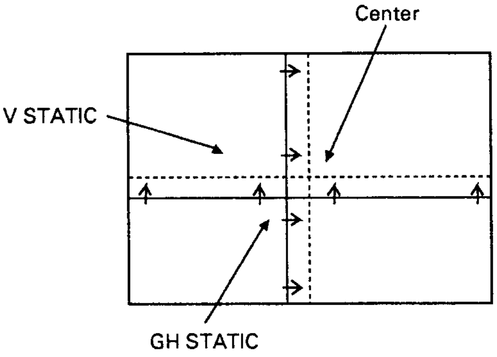
2 Adjustment signal input

For adjusting size...Frame size picture(EX.LD Test disc GGT1072, FRAME No. 5941),Monoscope, etc.
For screen joining, linearity, color adjustment...Use adjustment signals such as , cross-hatch, etc.
(EX.LD Test disc GGT1072, FRAME No. 7081,etc.)
If signals are created in the multi video processor, use them.
Input the above adjustment signals via the Multi Video Processor actually used.

Note : For the particulars about the FRAME No.,etc. of LD Test disc GGT1072,refer to the disc manual differently.

3 Center adjustment

Set to only green and adjust the center with V STATIC GH STATIC.

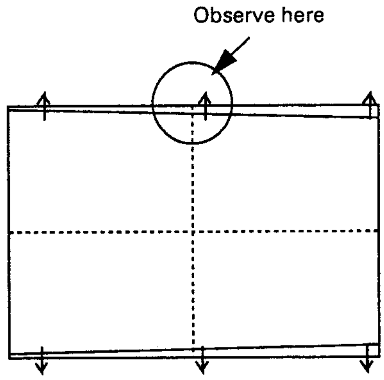

Center
V STATIC
GH STATIC

4 V SIZE, V LIN, H SIZE Adjustment

① V SIZE adjustment

Set to only green, observe the top part of the screen , and adjust the data amount in the vertical direction using V SIZE .

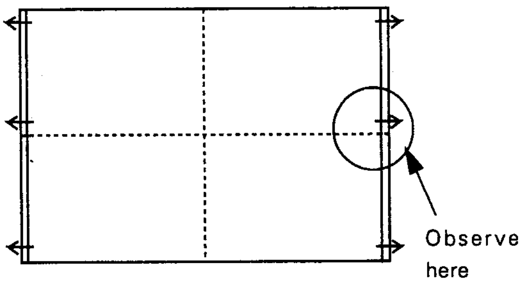
Do not observe the bottom part of the screen.



②H SIZE adjustment

Set to only green, observe the right side of the screen , and adjust the data amount in the horizontal direction using H SIZE .

Do not observe the left side of the screen.



③ V SIZE, V LINEARITY, H SIZE, GH LINEARITY adjustment

Those familiar with the convergence adjustment can adjust the bottom part of the screen in addition to the top part of the screen using V SIZE and V LINEARITY. Also it can adjust the left side of the screen in addition to the right side of the screen using H SIZE and GH LINEARITY.

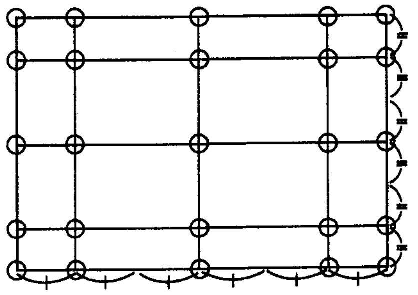
Reference Information

To adjust the NTSC input for horizontal 93% and vertical 92%, use the frame size screen of the LD test disc GGT1072 (frame No. 5941).

Horizontal : Adjust so that the sixth 92.5% line from the inside can be seen completely.
Vertical : Adjust so that the sixth 92.5% line from the inside can be seen only slightly.

5, 6, 7, Point convergence adjustment

Position of adjustment point on screen



◎In point convergence adjustment, the 25 points set on the screen can be adjusted individually.
In addition, the area (total ten areas of five lines and ranks) of the four sides of the screen can be adjusted.

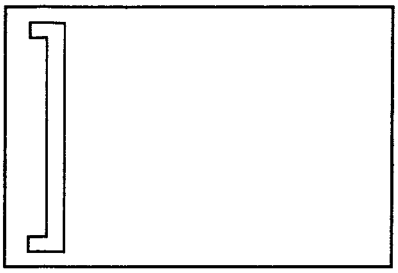
NOTES

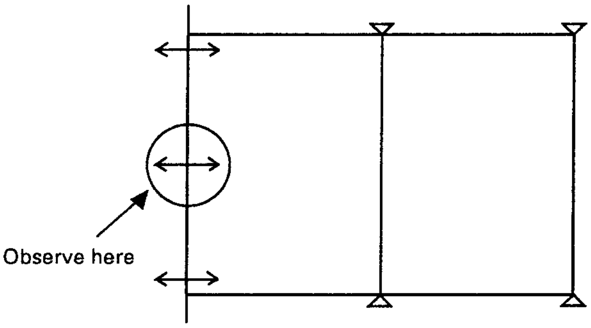
- *The adjusting points set by the circuit are fixed at the positions shown in the figure. In some cases, the OSD display may deviate. But the actual adjusting points are as shown in the figure.*
- *Deviation between two adjusting points will naturally be corrected when the deviation of each point is corrected.*

Movement of screen by point convergence adjustment

OSD display

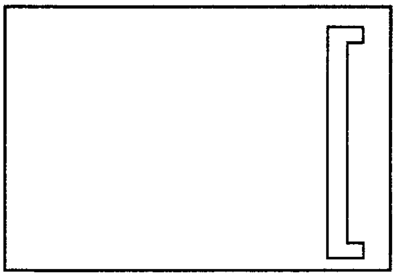
Movement of screen

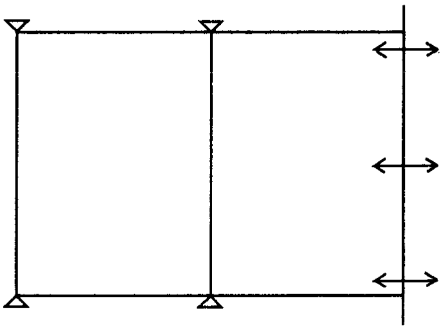


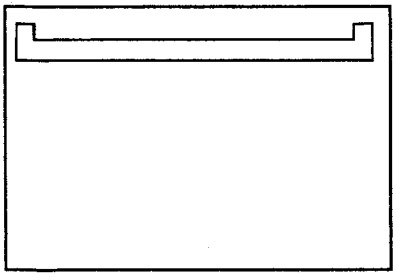


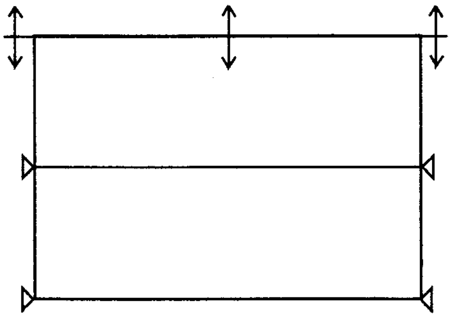
Use especially when adjusting the horizontal size of the left side of the screen.

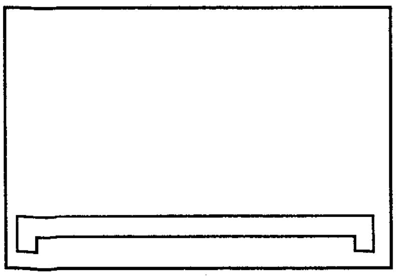
In addition, there are nine other area adjustments. It is a convenience to adjust deviation of circumference screens.

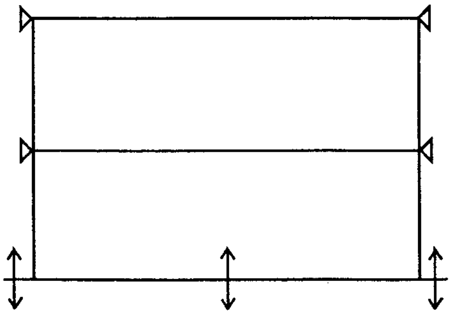


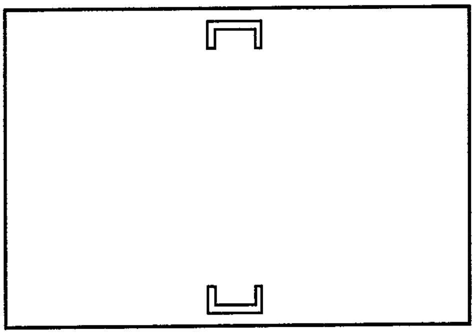


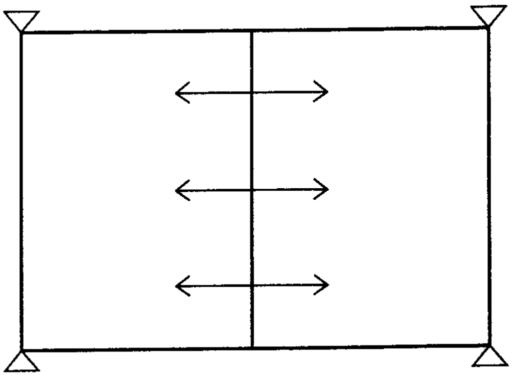


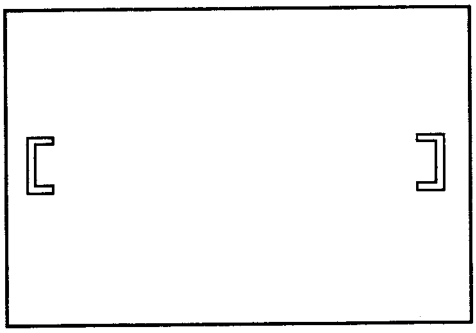


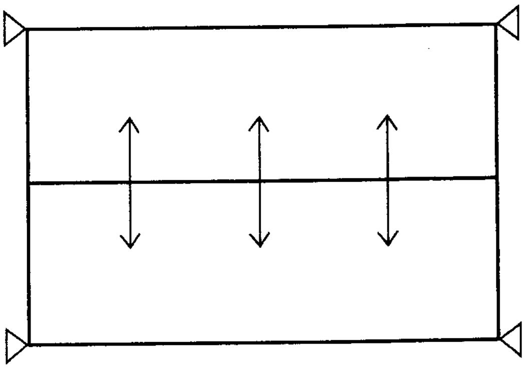


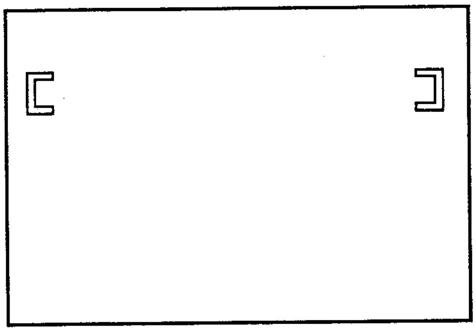


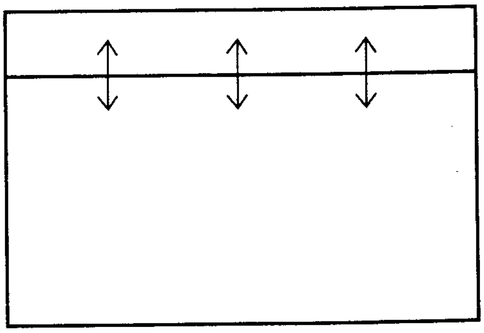


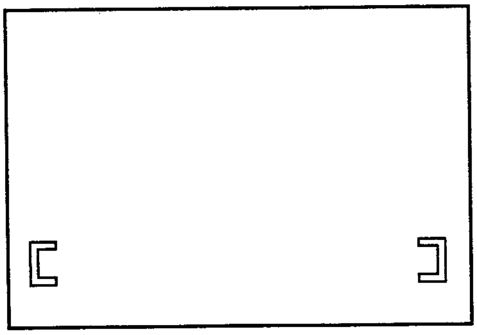


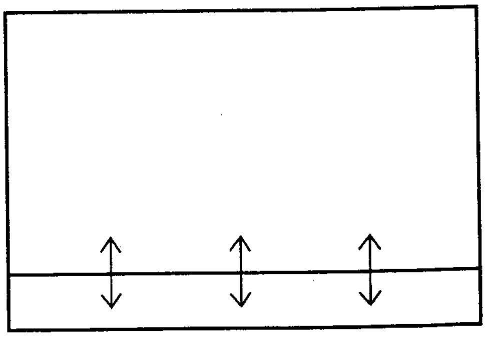


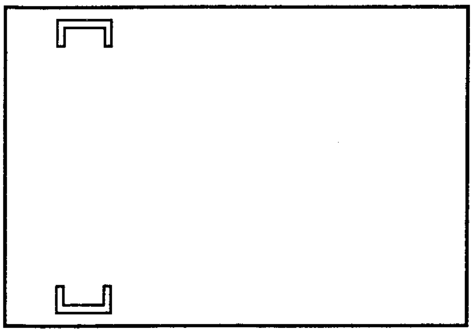


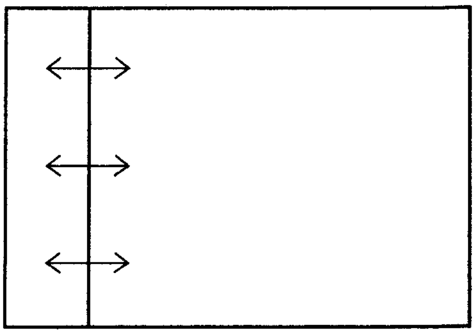


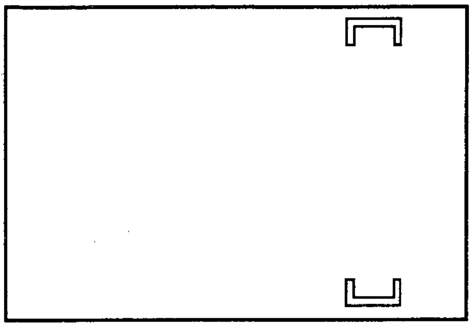


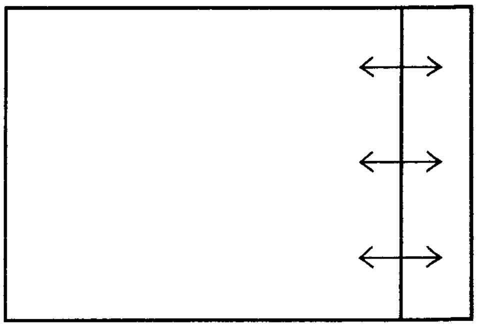




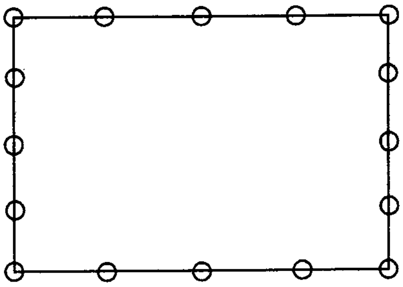


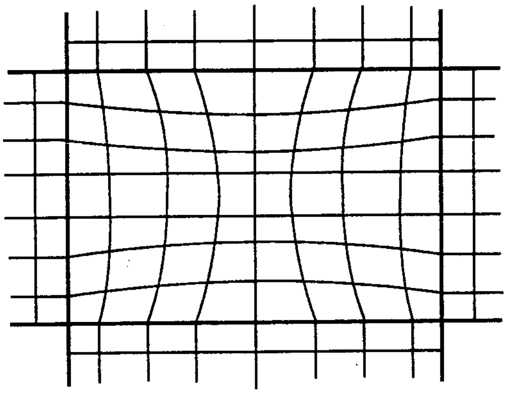




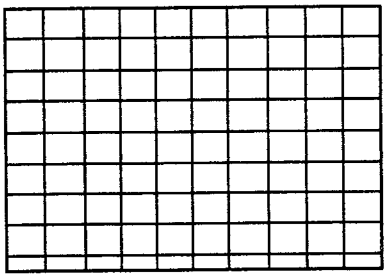


In adjustment step 5, observe the external part of the screen, adjust the 16 adjusting points there, taking note of linearity in the peripheral area such as joining with other screens, crosshatch, etc.
(Ignore the distortion inside the screen.)





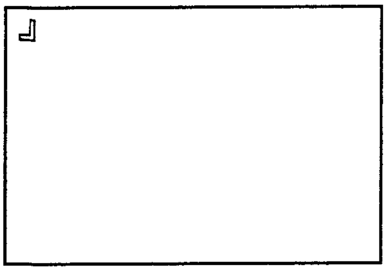
In adjustment step 6, adjust the inside of the screen and produce linearity.

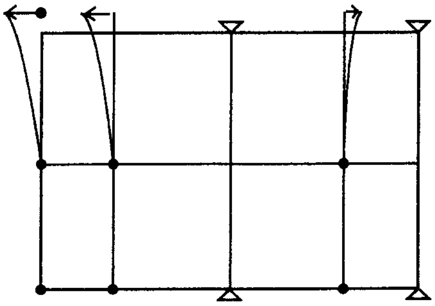


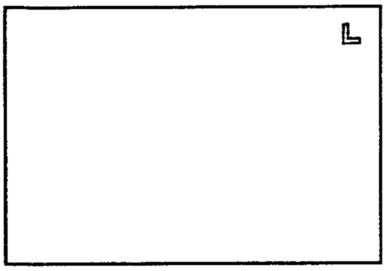
The following are examples of adjusting points in point convergence adjustments and their movements on the screen.

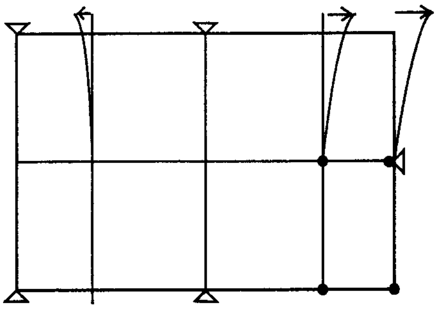
Displayed OSD

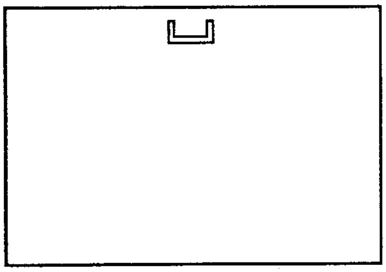
Movement on screen

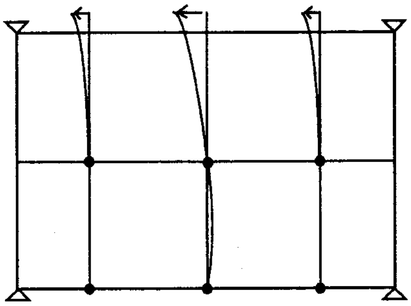


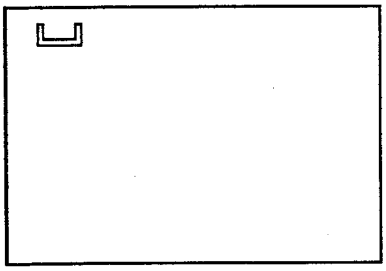


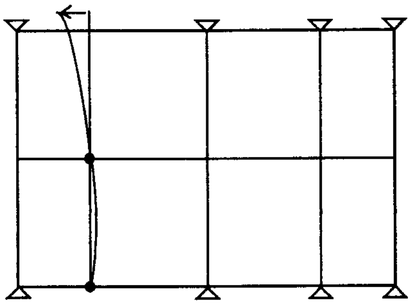


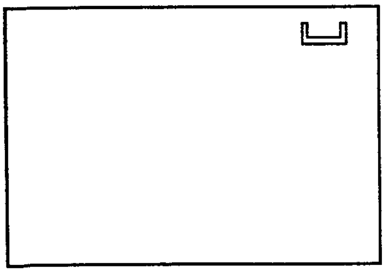


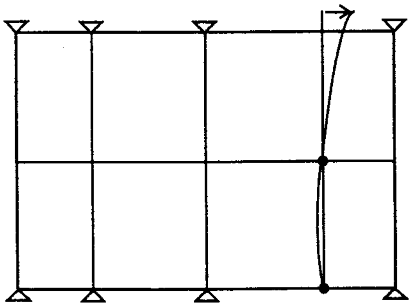


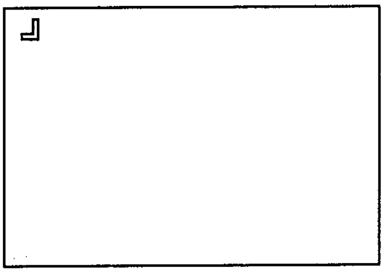


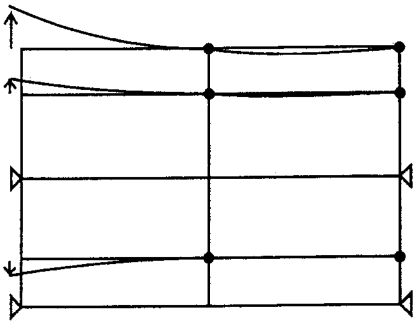


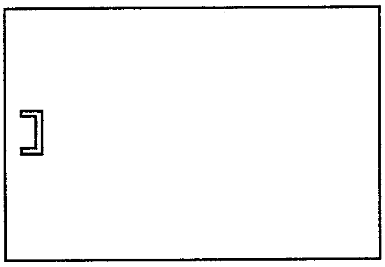


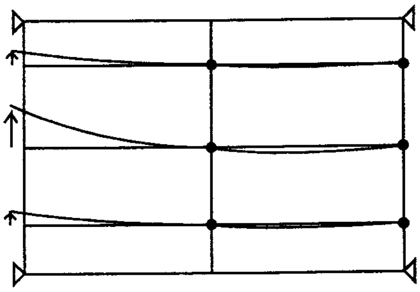


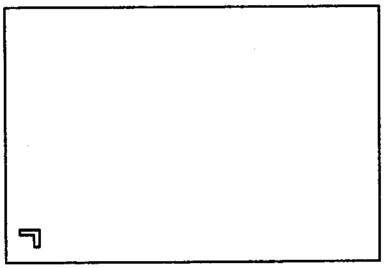


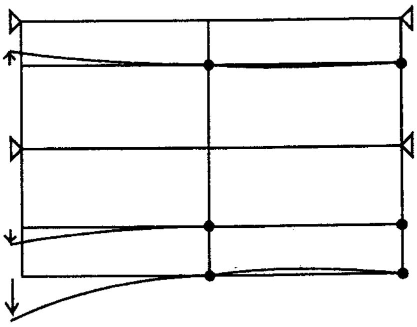


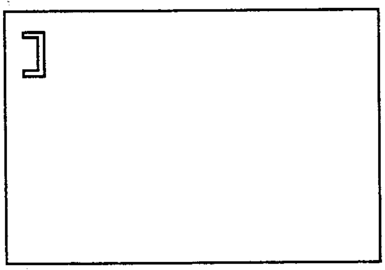


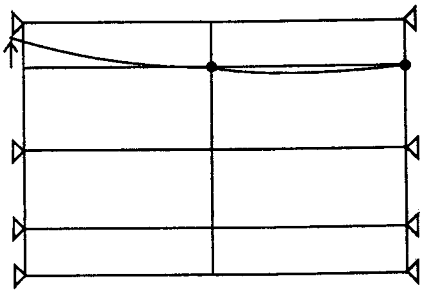


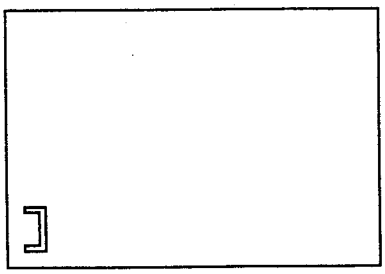


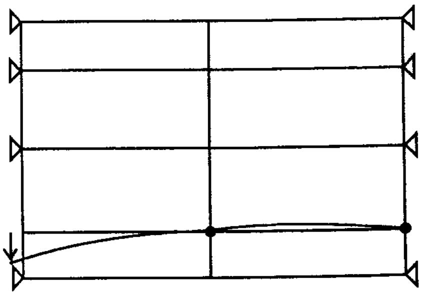


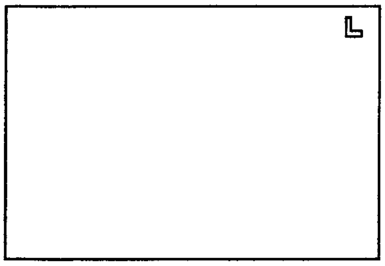


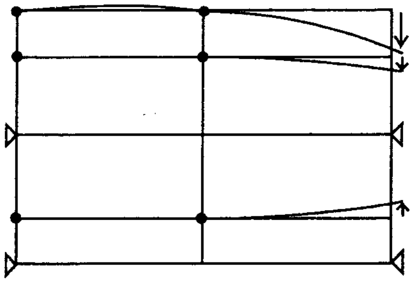


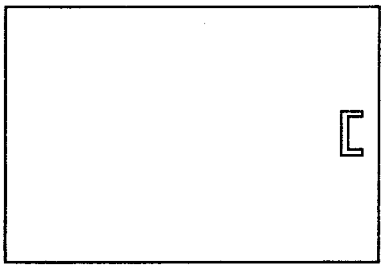


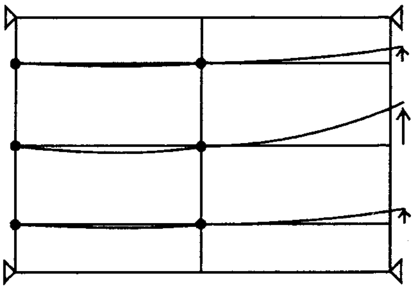


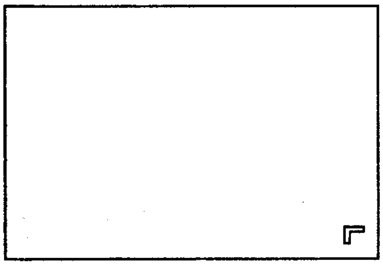


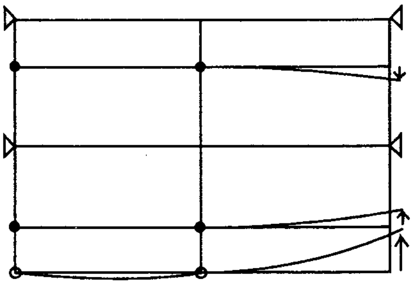


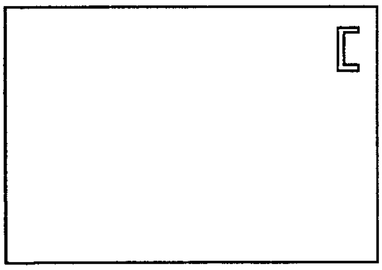


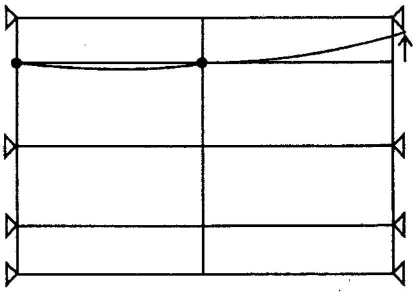


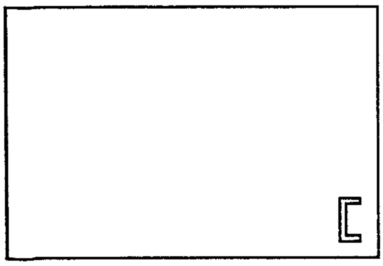


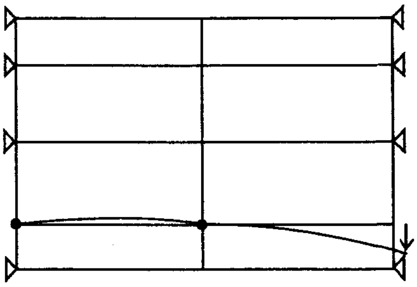


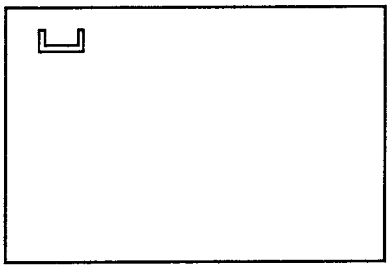


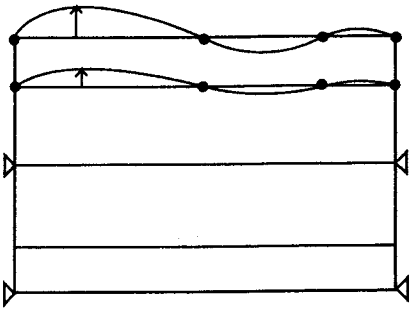


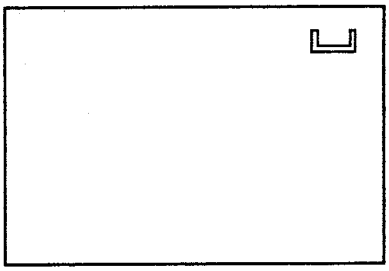


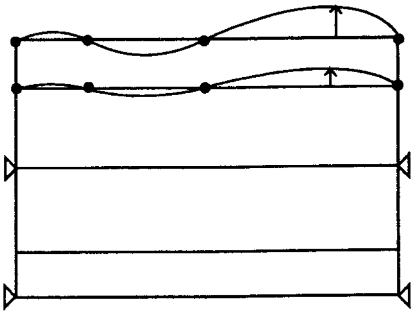


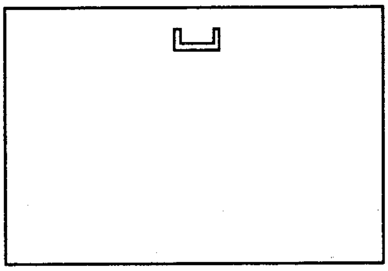


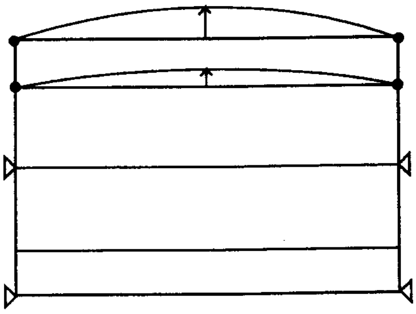


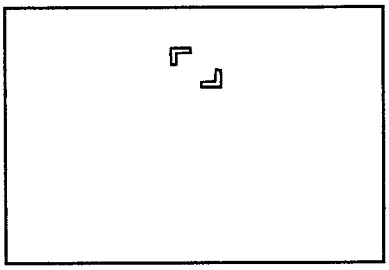


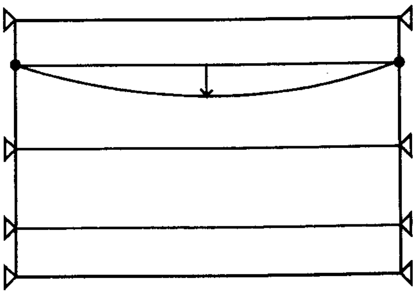


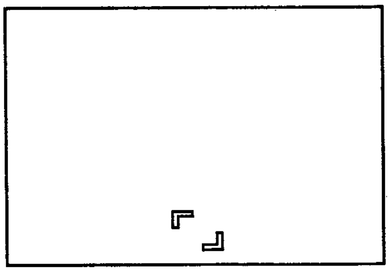


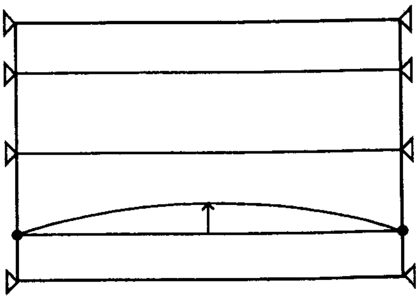




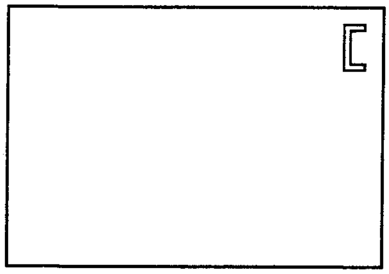


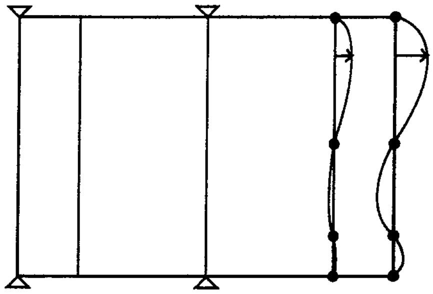


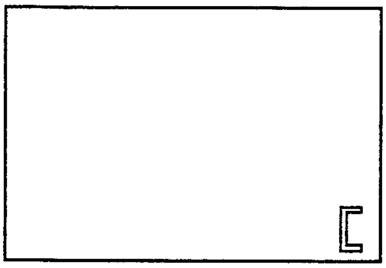


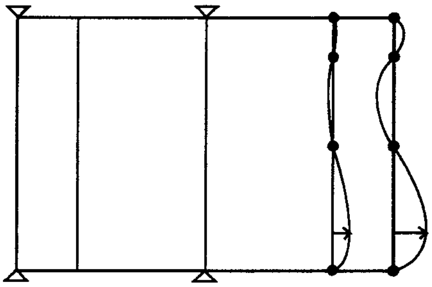


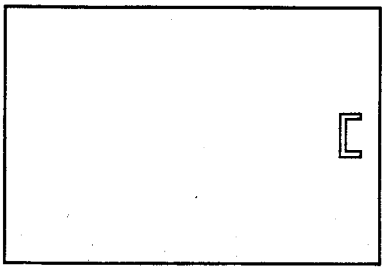
RM-V2400NA,RM-V2500NA
RM-V2400NE,RM-V2500NE

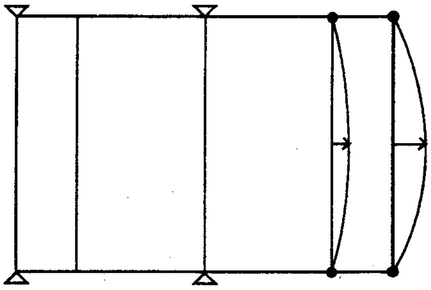


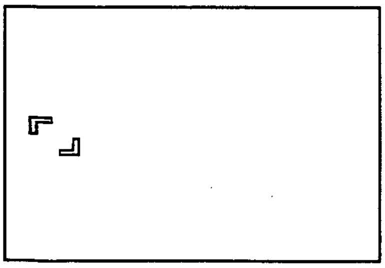


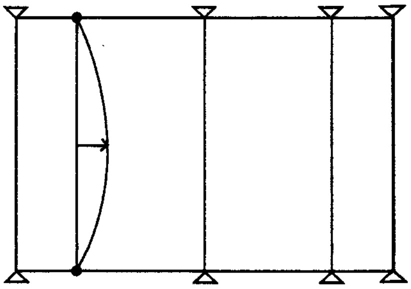


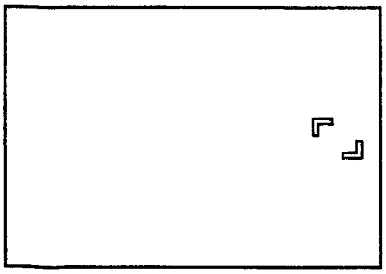


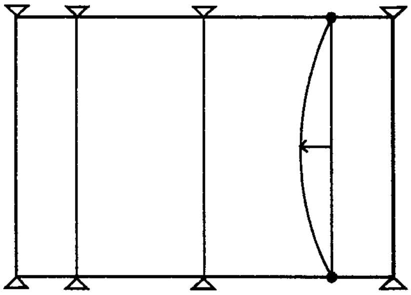








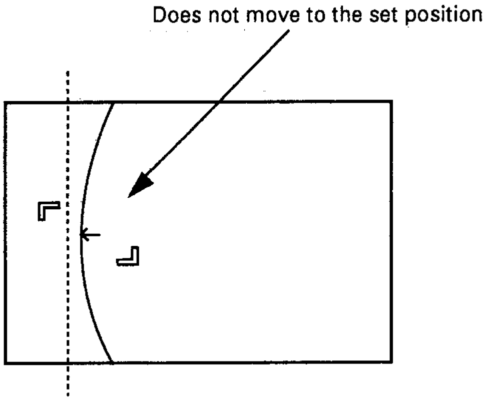


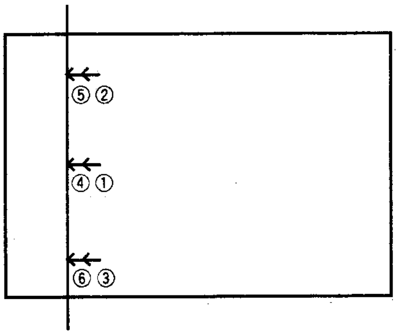


NOTE

If only one point is moved greatly in the point convergence mode, it may not move in areas smaller than the desired adjusting area.

In this case, adjust while moving the other points slowly.

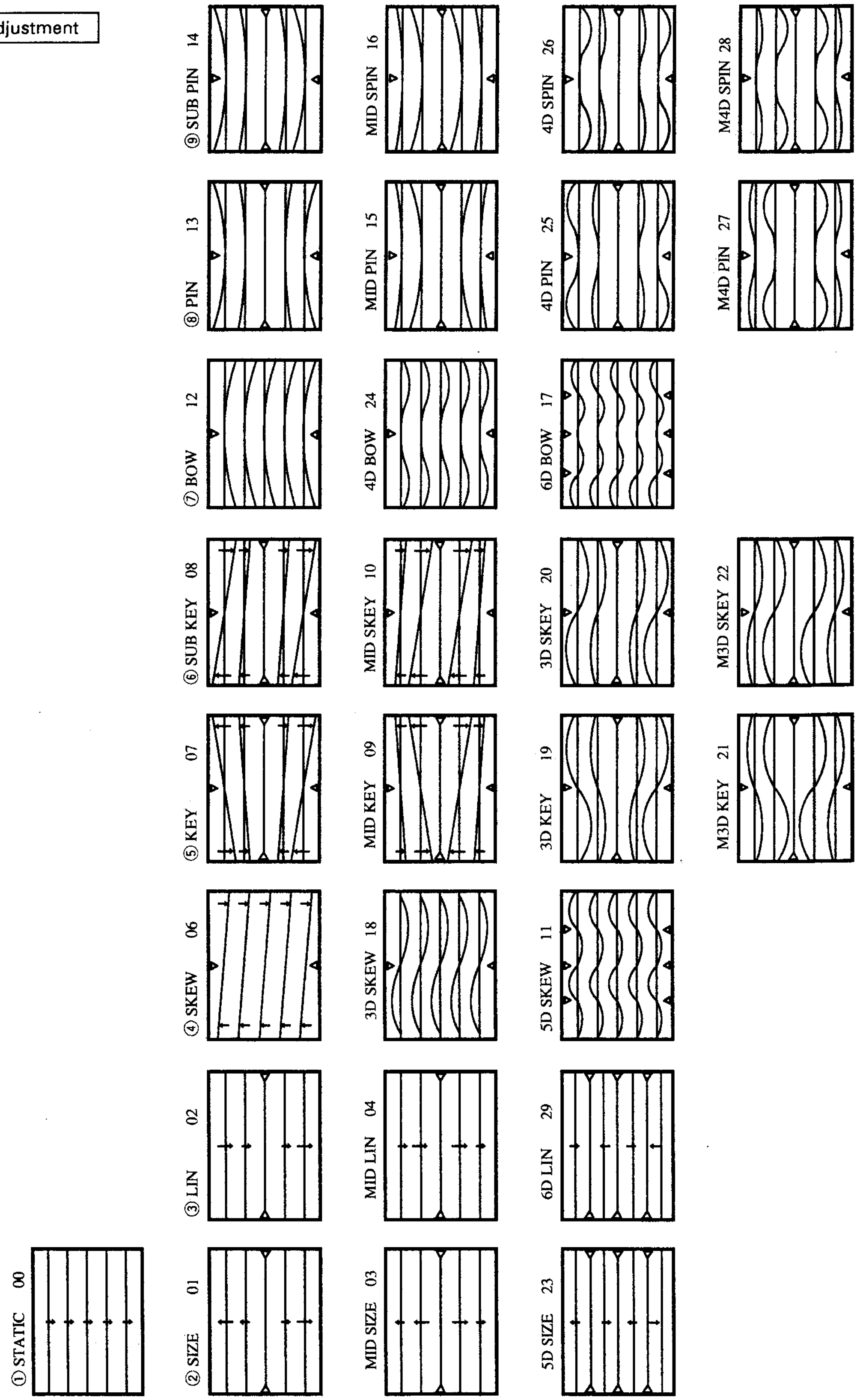

Does not move to the set position



5' Dynamic convergence

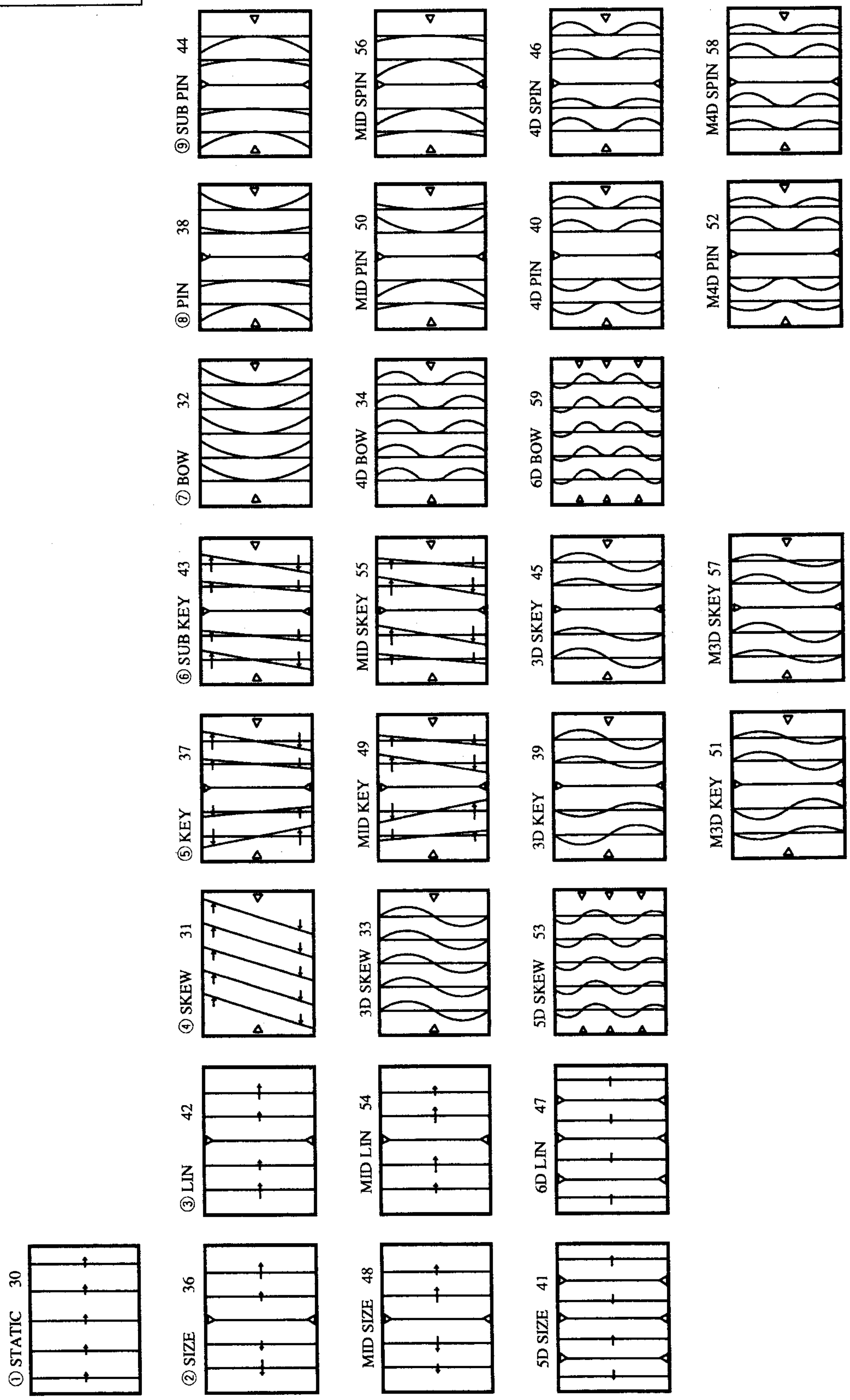
In addition to the point convergence mode, conventional convergence adjustments can also be performed.

V • Convergence adjustment


① STATIC 00
② SIZE 01
MID SIZE 03
5D SIZE 23
③ LIN 02
MID LIN 04
6D LIN 29
④ SKEW 06
3D SKEW 18
5D SKEW 11
⑤ KEY 07
MID KEY 09
3D KEY 19
M3D KEY 21
⑥ SUB KEY 08
MID SKEY 10
3D SKEY 20
M3D SKEY 22
⑦ BOW 12
4D BOW 24
6D BOW 17
⑧ PIN 13
MID PIN 15
4D PIN 25
M4D PIN 27
⑨ SUB PIN 14
MID SPIN 16
4D SPIN 26
M4D SPIN 28

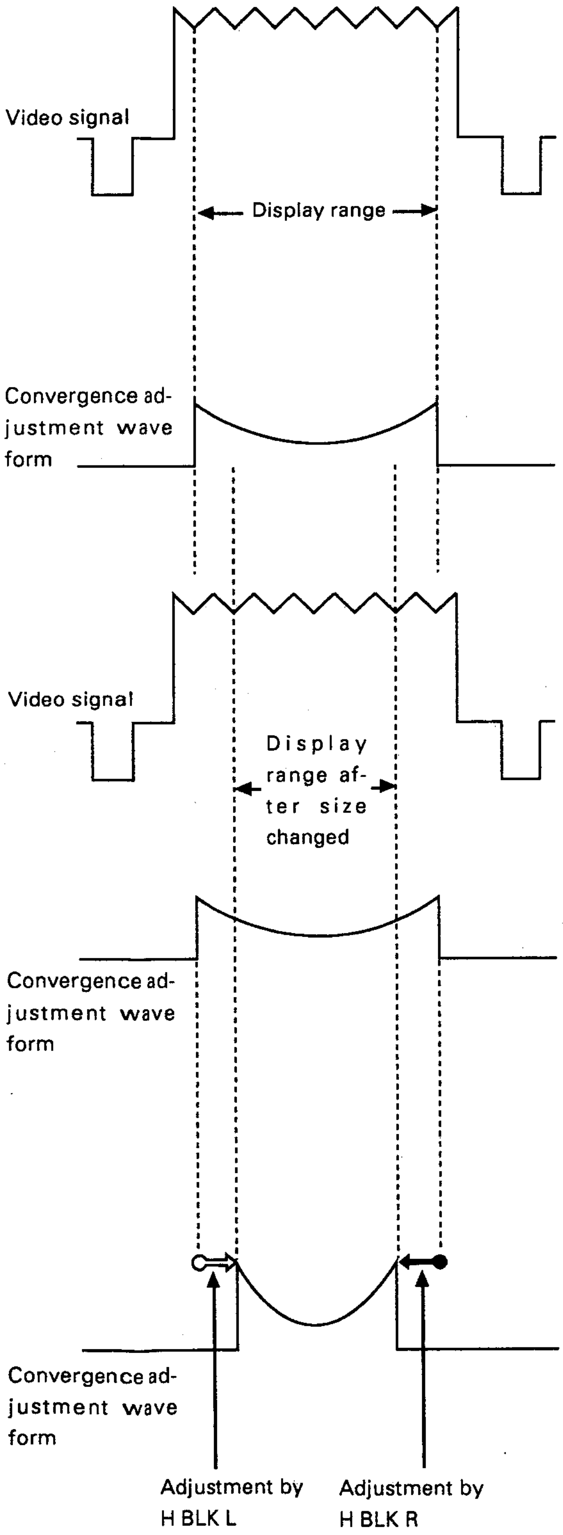
5' Dynamic convergence

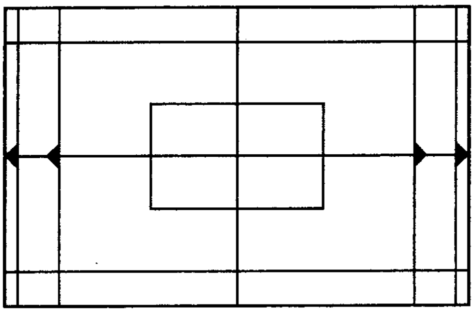
H • Convergence adjustment

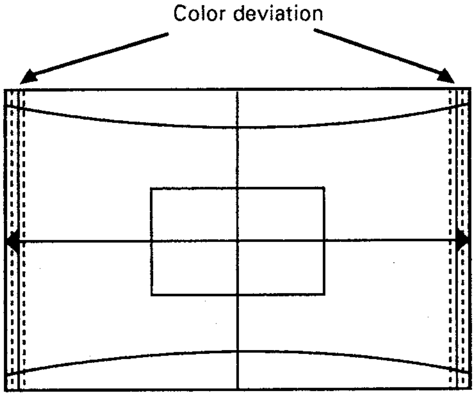

① STATIC 30
② SIZE 36
MID SIZE 48
5D SIZE 41
③ LIN 42
MID LIN 54
6D LIN 47
④ SKEW 31
3D SKEW 33
5D SKEW 53
⑤ KEY 37
MID KEY 49
3D KEY 39
M3D KEY 51
⑥ SUB KEY 43
MID SKEY 55
3D SKEY 45
M3D SKEY 57
⑦ BOW 32
4D BOW 34
6D BOW 59
⑧ PIN 38
MID PIN 50
4D PIN 40
M4D PIN 52
⑨ SUB PIN 44
MID SPIN 56
4D SPIN 46
M4D SPIN 58

8 H BLK L and H BLK R Adjustments

H BLK L and H BLK R adjustments are performed to obtain the optimum convergence adjustment wave form when the display range changes due to changes in the H SIZE.


Video signal
Display range
Convergence adjustment wave form
Video signal
Display range after size changed
Convergence adjustment wave form
Convergence adjustment wave form
Adjustment by H BLK L
Adjustment by H BLK R




Color deviation

When size is increased with H BLK L and H BLK R not adjusted.

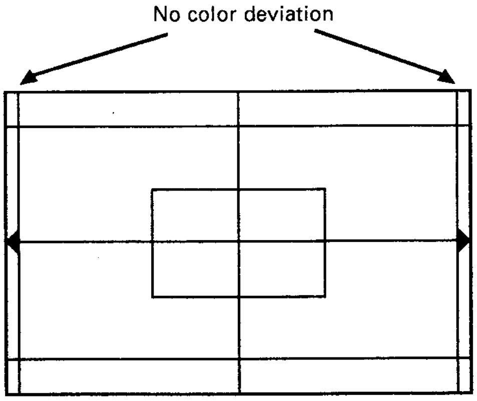
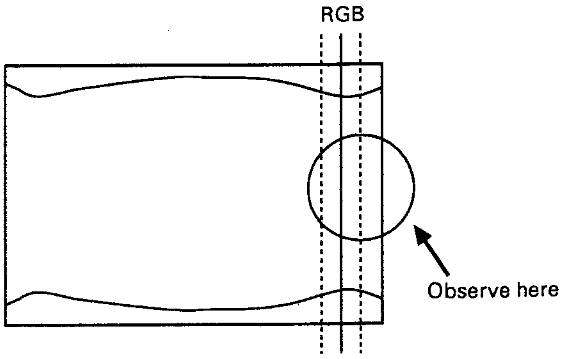
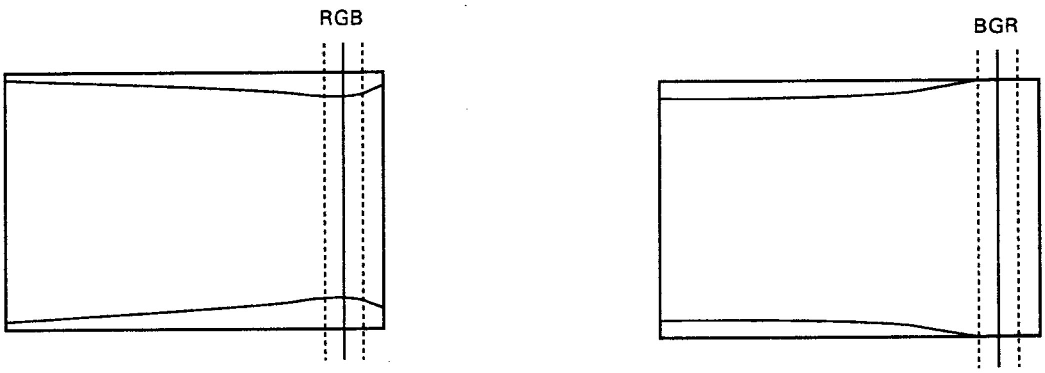

No color deviation

Image after H BLK L and H BLK R has been adjusted.

H BLK R Adjustment

Output all three colors R, G, B, observe the right side of the screen, and adjust with H BLK R so that the color stops deviating.

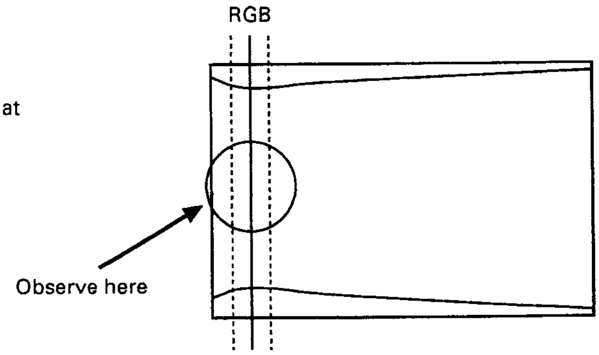




When H BLK R adjustment is not properly performed

H BLK L adjustment

Output all three colors R, G, B, observe the left side of the screen, and adjust with H BLK L so that the color stops deviating.

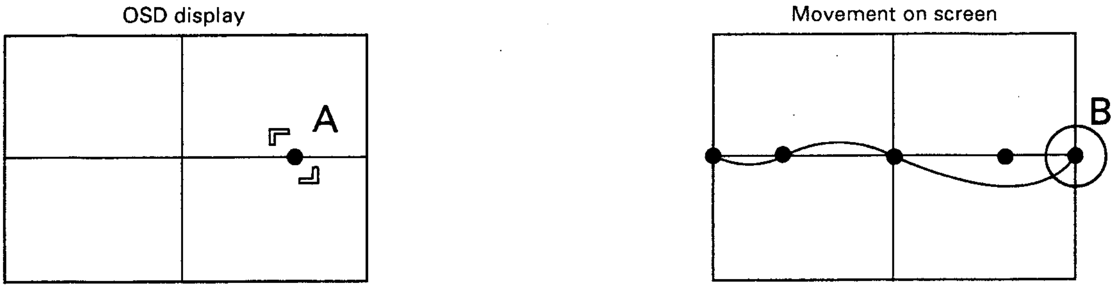


NOTE

There are points at which the screen does not move even through the H BLK L value changes. This is not a malfunction.

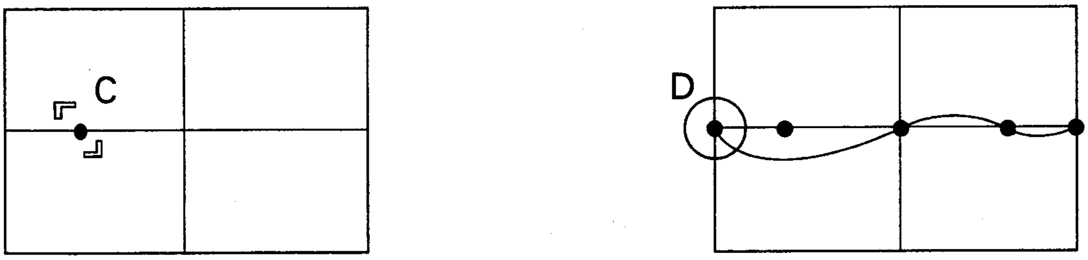
Confirming the Optimum H BLK L, H BLK R Values

Optimum H BLK R value



When point A is lowered by point convergence, point B should not move.

Confirming the Optimum H BLK L Value



When point C is lowered by point convergence, point D should not move.

Note

Convergence can be adjusted even if the optimum values are slightly different from the above optimum values during adjustments.

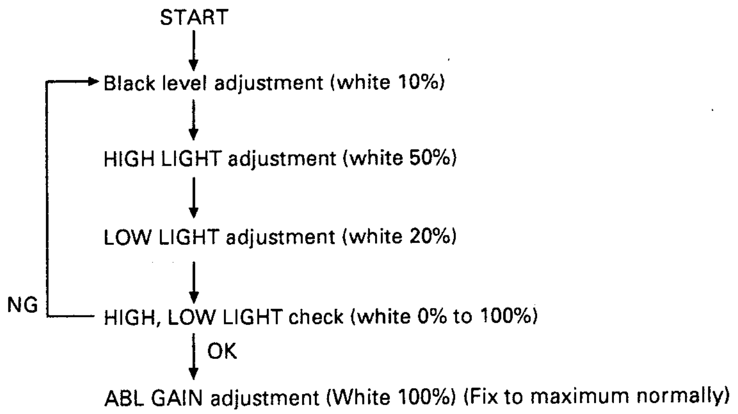
But, if the screen changes markedly, re-adjust H BLK L or H BLK R, and adjust the convergence.

8.3 WHITE BALANCE ADJUSTMENT MODE

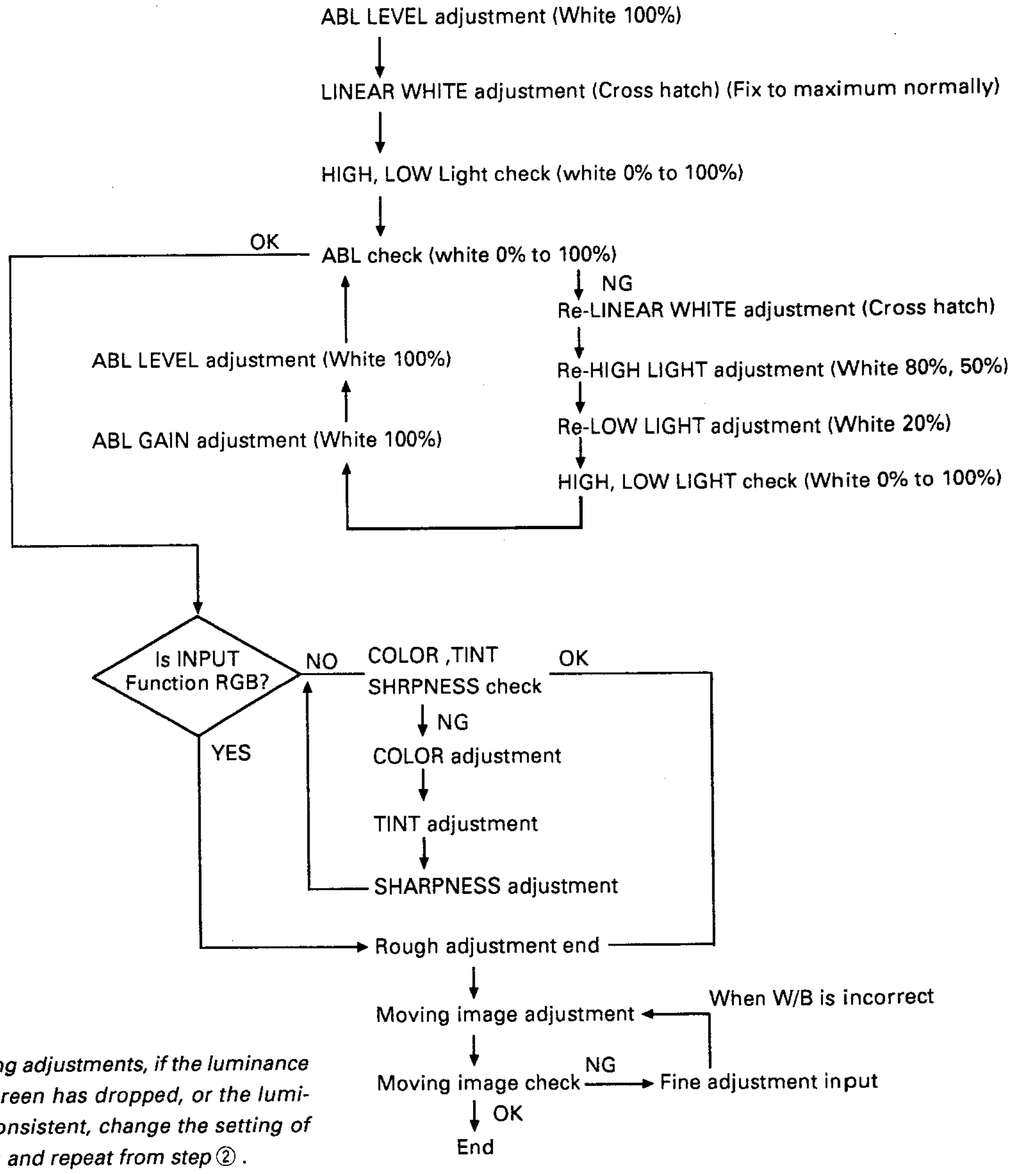
(1) White Balance Adjustment Flowchart

○ When adjusting the multiprojection unit Initial setting Multi on
ABL switching setting (Refer to (5) White Balance Adjustment)

① White Balance Adjustment (COMBI OFF)


START
Black level adjustment (white 10%)
HIGH LIGHT adjustment (white 50%)
LOW LIGHT adjustment (white 20%)
NG
HIGH, LOW LIGHT check (white 0% to 100%)
OK
ABL GAIN adjustment (White 100%) (Fix to maximum normally)

② ABL link and LINEAR WHITE flesh color adjustment (COMBI ON)


ABL LEVEL adjustment (White 100%)
LINEAR WHITE adjustment (Cross hatch) (Fix to maximum normally)
HIGH, LOW Light check (white 0% to 100%)
OK
ABL check (white 0% to 100%)
NG
Re-LINEAR WHITE adjustment (Cross hatch)
Re-HIGH LIGHT adjustment (White 80%, 50%)
Re-LOW LIGHT adjustment (White 20%)
HIGH, LOW LIGHT check (White 0% to 100%)
ABL LEVEL adjustment (White 100%)
ABL GAIN adjustment (White 100%)
Is INPUT Function RGB?
NO
YES
COLOR ,TINT SHRPNESS check
OK
NG
COLOR adjustment
TINT adjustment
SHARPNESS adjustment
Rough adjustment end
Moving image adjustment
When W/B is incorrect
Moving image check
NG
Fine adjustment input
OK
End

Note
After completing adjustments, if the luminance of the multi-screen has dropped, or the luminance is not consistent, change the setting of the ABL switch and repeat from step ②.

(2) White Balance Adjustment

● Entering the adjustment mode

This adjustment is executed in adjustment mode. First, press the both (ADJ IN) key of the remote control to enter adjustment mode. The main menu is displayed when adjustment mode is entered. When at this time the 6 key is pressed, white balance adjustment mode will be entered.

● White balance adjustment mode

The letters displayed at the right bottom of the screen indicate the white balance adjustment item types. Selection is possible by pressing from the 0 key to the D key. Further, numbers are displayed under the items, but these are set values, and adjustment is made with the ◁/- key and the +/▷ key.

Key No.	Adustment Type	Key No.	Adustment Type
0	ABL GAIN	7	RED HIGH-LIGHT
1	CONTRAST	8	GREEN HIGH-LIGHT
2	BRIGHTNESS	9	BLUE HIGH-LIGHT
3	COLOR	A	RED LOW-LIGHT
4	TINT	B	GREEN LOW-LIGHT
5	SHARPNESS	C	BLUE LOW-LIGHT
6	LINEAR WHITE	D	ABL LEVEL

① Before Adjusting White Balance

Adjusting the white balance means to adjust the color tone. This adjustment is necessary for the screen to become white when the white signal is input, and black when the black signal is input. In the actual adjustment, the bias and gain of the CRTs for the three colors (R, G, and B) are adjusted so that the screen becomes the same color tone.

Before performing the white balance adjustment, complete the convergence adjustment first. If not performed properly especially where the screens join each other, the colors of the screens may not join. When performing the adjustment, take into account the position and height of the sets, height of the eyes of those viewing the screens, and distance to the screens. There are two types of screen white balance data-video, Y/C input and RGB input. The data is switched when the screens are switched. For RGB input, COLOR, TINT, and SHARPNESS cannot be adjusted. When the ABL is OFF, ABL LEVEL cannot be adjusted.

NOTE ✱ : In the PAL signal ,TINT cannot be adjusted even in the video or Y/C input .

② ABL switch Setting

In ABL setting, when the luminance of units completely match the unit which ABL voltage is controlled the most and luminance is lowest, the luminance of the whole multi-screen becomes low.

The ABL switch is able to switch the amount of ABL control voltage when ABL is on.

This switch has three modes-ABL1, ABL2, and ABL3.

Amount of voltage of other units adjusted to the unit whose ABL voltage is controlled the most

ABL1 ABL2 ABL3
Small ◀——▶ Much

Luminance inconsistency on multi-screen

ABL1 ABL2 ABL3
Much ◀——▶ Small

Luminance of whole multi-screen

ABL1 ABL2 ABL3
High ◀——▶ Low

◎Recommended Usage of Modes

ABL1 When importance is placed on luminance level of whole multi-screen rather than consistency of luminance of multi-screen
(Outdoor, large amount of multi-screens, etc.)

▲

ABL2

▼

ABL3 When importance is placed on consistency of luminance of multi-screen rather than luminance level of whole multi-screen
(No gap, small amount of multi-screens, etc.)

At shipment, the ABL switch will be set to ABL3.

③ Adjustment Flow

Single screen

[1] Perform the adjustment using the full white (variable by %) signal generator.
[2] Perform the COLOR, TINT, and SHARPNESS adjustments.
[3] Note down or memorize in the PC memory the data after the rough adjustment.
[4] Check the joining of the screens using the animated images.
[5] If the screens are not joined properly, adjust. (Check with animated images.)
[6] If not joined properly, return to the data in (2) and perform the adjustment again.

④ Initial Settings

CONTRAST	128
BRIGHTNESS	Depends on auto W/B
ABL GAIN	MAX (255)
ABL LEVEL	128
LINEAR WHITE	MAX (255)
R,G,B,HIGH LIGHT	Data at shipment
R,G,B,LOW LIGHT	
*SHARPNESS	
*TINT	
*COLOR	

*Must be set only for VIDEO and Y/C input.
TINT adjustment cannot be performed for PAL inputs

- CONTRAST, LINEAR WHITE, ABL LEVEL, ABL GAIN adjustment values considerably affect the ABL operation.
  Fix the initial value for ordinary use.
- Perform the W/B adjustment in the order of R/G/B HIGH LIGHT and R/G/B LOW LIGHT. (Fix the CONTRAST and BRIGHTNESS.) Change the HIGH LIGHT luminance using G HIGH LIGHT and the LOW LIGHT luminance using G LOW LIGHT.
- Basically, fix the CONTRAST level to 170, if the ABL function feature well.

⑤ Rough Adjustments

(1) Black level adjustment **Signal:White 10%**

Adjust R LOW, G LOW, and B LOW to the point where the CRT starts lighting up.

(2) HI LIGHT adjustment **Signal:White 50%**

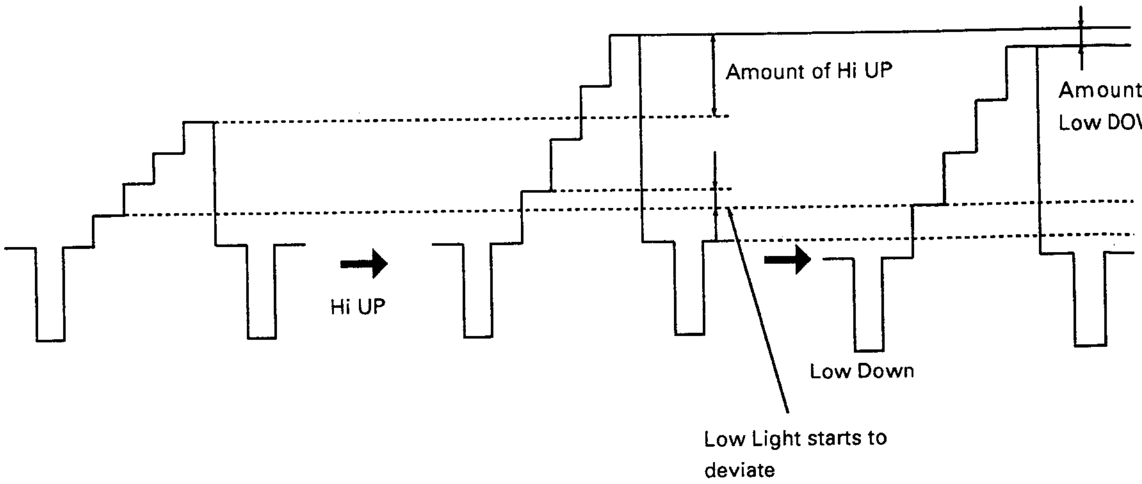
Adjust R HI, G HI, and B HI so that the CRT becomes white. First, adjust so that the brightness of R, G, and B becomes the same, and while maintaining that brightness, balance R, G, and B, and adjust so that the CRT becomes white.

(3) LOW LIGHT adjustment **Signal:White 20%**

Adjust R LOW, G LOW, and B LOW so that the CRT becomes gray.

(4) Convergence adjustment **Signal:White 50%, 20%**

Repeat (2) to (3) and converge the light. If the HI LIGHT of R, G, and B is moved, their LOW LIGHT will change greatly. Therefore, pay special attention to the value of the LOW LIGHT.

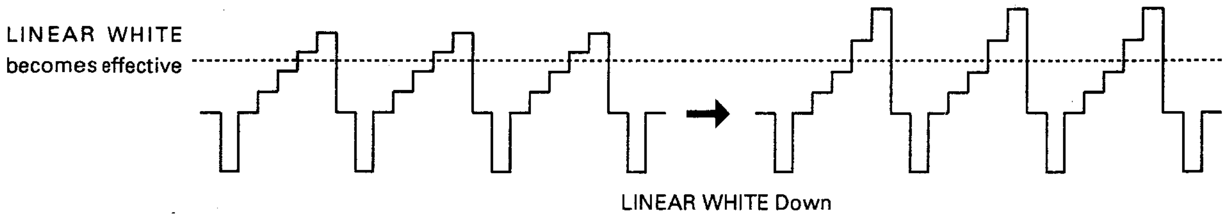


⑥ LINEAR WHITE adjustment

When white peak signals such as WINDOW are input, due to the characteristics of the Blue CRT, there is a tendency for the peak to become yellow compared to other colors. The linear white adjustment is performed to correct this tendency.

Blue becomes weak when data is set to UP and strong when set to DOWN. If Linear White is added excessively, the ABL voltage becomes unbalanced and the medium luminance of blue may be erased, etc.

Also make sure that the blue is not blur when MULTI ON is set because the top left and bottom left of the screen are affected first.



⑦ ABL GAIN adjustment (White 100%)

The ABL GAIN adjustment adjusts the white 100% luminance of a unit to other units after low luminance and medium luminance have been adjusted.

Normally, when white 100% is input, ABL is imposed and the current is controlled so that the current flowing in the CRT does not exceed a certain level. Even if the current flowing in the CRT of each unit is the same, the difference in the characteristics of each CRT will cause their luminance to become inconsistent. The ABL GAIN adjustment converges this inconsistency. It adjusts the ABL current flowing virtually.

In white 100% inputs, as the ABL works efficiently, the luminance drops, when the ABL GAIN of a unit with high luminance is decreased, use this adjustment to adjust its luminance to the other units.

Turn off the ABL in the adjustment.

Normally set the ABL GAIN to maximum.

⑧ ABL LEVEL adjustment (White 100%)

The ABL LEVEL adjustment controls the inconsistency of the ABL control voltage of each unit when ABL is on.

[1] Set the ABL of all units to ON.
[2] Turn on and off the ABL of each unit to change the luminance.
[3] For units whose luminance becomes dark when ABL is ON, turn UP the ABL level and set to the point where the luminance stops changing by turning on and off the ABL.
[4] For units whose luminance does not change, turn DOWN the ABL level to the point just before the luminance becomes dark.
[5] Perform steps (2) to (4) for all the units, change white from 0 to 100% and check that the ABL does not work abnormally.

⑨ Adjustment Using Moving Images

The adjustment using images adjusts the overall joining of the screens by loading discs used by users (for actual performance) and discs always used for adjustments. View the overall screen and adjust the screen with the greatest difference to the other screens. The specific method is;at first, focus on the brightness, make the brightness the same, and correct the differences in R, G, and B. Pay the attention that changing the HI LIGHT value affects the balance of the LOW LIGHT considerably. Strictly speaking, as W/B deviation cannot be checked using moving images and W/B cannot be corrected just by performing fine adjustments, check using rough adjustments.

If the DEMONSTRATION-II LD can be used, correct the following points.

[1] Dark images (Almost black image:FRAME No. 32300 to 33200)

Check that the brightness of the screens appears the same.
Check that black is not blur or emphasized.

[2] Bright images (Almost white image:FRAME NO. 7400 to 8100)

Focus on where the brightness is the same, especially the white peak, and check in the same way as for dark images in (1).

[3] Skin color images (FRAME NO. 26900)

Check if the skin color of a face image is the same as in the other screens.

[4] Colored images (FRAME NO.19100)

Use when performing adjustments during VIDEO input or Y/C input. Adjust so that the colors of vegetables, fruits, etc. are of the same brightness and same depth.

If consistency cannot be adjusted with animated images, re-input the rough adjustment data and re-adjust.

✱View the moving images. If a screen is darker than the others due to excessive ABL, increase the contrast and decrease the R, G, B High Light so that ABL is suppressed.

[5] White peak images (FRAME NO.08272)

Readjust the Linear White adjustment, if the whiteness on the white peak screen differed on each screen.

⑩ Confirm the moving images

View the moving images. If W/B is incorrect, set to rough adjustment. If the luminance of the multi-screen is dark or inconsistent, set the ABL switch.

⑪ Precautions

[1] Avoid adjusting with images with high tube radiation (FRAME NO. 13590)

If only one spot is bright in a very dark image, the screen will look bright due to the spot.

[2] Precautions on screen hue

If the hue of the screens is green or yellow, images will not be displayed clearly. The white parts of bright images especially will appear yellow. These images can be made clear by adjusting so that they appear slightly bluish.
However, if made bluish excessively, brightness may appear insufficient due to the CRT characteristics.

[3] Color Adjustment (White Balance)

(a)Effects of brightness

- Take note of dark images which have some high luminance parts.
- The reflected light overlap with surrounding dark parts at the face of the CRT and surface of projection lens, and luminance and hue become different from the adjoining screen.

(b)Differences caused by visual points

- Although the joined parts of multiple screens are improved by peripheral light amount correction, the image may not be natural at some points. (Adjustment of vertical direction using the installation table)
- Due to the layout of the red, green, and blue CRTs, when the screens are viewed diagonally, they may appear reddish or bluish (Color shift).
- For multiple screens, as the angles of the left and right screens are different to a viewer, they may appear to have different colors.

◎Before adjustments, check the user's visual point, and adjust at that point.

(c)

- Because the white balance is adjusted using high light (drive) and low light (cutoff), the red, green, and blue may not be balanced at the mid-range of luminance. In this case, adjust R, G, B, LOW LIGHT or R, G, B, HIGH LIGHT at the mid-range, and make the balance of these colors consistent from low luminance to high luminance.

(3) External Control by RS-232C

As Multi projection unit is equipped with a RS-232C port, various controls and, white balance and convergence adjustments can be performed by an external computer.
By programming software ,it is possible not only to adjust White Balance,Convergence but to save and control the adjustment data of each source.

① Interface

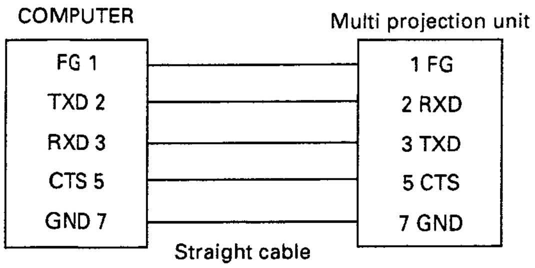
[1]Connector
D-sub 25-pin
[2]Pin assignment

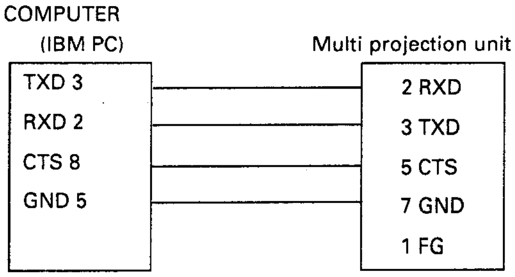
PIN No.	Symbo;	Signal Name
1	FG	Frame Ground
2	RXD	Received Data
3	TXD	Transmitted Data
5	CTS	Clear To Send
7	GND	Signal Ground

[3]Baud rate
4800 bps (1200, 2400, 9600, 19200 bps can also be selected)

[4]Data format
Start:1-bit
Data:8-bit
Parity:0 (No parity)
Stop:1-bit

[5]Connection


COMPUTER
Multi projection unit
FG 1
TXD 2
RXD 3
CTS 5
GND 7
1 FG
2 RXD
3 TXD
5 CTS
7 GND
Straight cable


COMPUTER
(IBM PC)
Multi projection unit
TXD 3
RXD 2
CTS 8
GND 5
2 RXD
3 TXD
5 CTS
7 GND
1 FG

[6]Protocol
Multi projection unit from computer

stx	ID	COMMAND	etx

ID : 2-Byte(ASC II)COMMAND : 3-Byte(ASC II)
stx=02h etx=03h

stx	ID	COMMAND	COMMAND	COMMAND	etx

Up to 3 commands possible

stx	ID	COMMAND	ARGUMENT	etx

*

ARGUMENT : 3-Byte(ASC II)
Note : * In case of the numeral direct command

② RS-232C Commands Table

	Command	Name	Normal Valid	Number Direct	UP/DW Command	Function
A	ABL	ABL LEVEL	×	○	○	ABL operation link level adjustment (Note 1)
	AJN	ADJUST NO	×	×	×	Adjustment mode exit
	AJY	ADJUST YES	○	×	×	Adjustment mode start-up
	AOF	ALL OFF	○	×	×	R,G,B all color off
	AON	ALL ON	○	×	×	R,G,B all color on
	ABG	ABL GAIN	×	○	○	ABL gain adjustment
B	B00	BLUE 00	×	○	○	Adjusts BV STATIC
	B01	BLUE 01	×	○	○	Adjusts BV SIZE
	B02	BLUE 02	×	○	○	Adjusts BV LINEARITY
	B03	BLUE 03	×	○	○	Adjusts MID SIZE
	B04	BLUE 04	×	○	○	Adjusts MID LIN
	B06	BLUE 06	×	○	○	Adjusts BV SKEW
	B07	BLUE 07	×	○	○	Adjusts BV KEY
	B08	BLUE 08	×	○	○	Adjusts BV SUB KEY
	B09	BLUE 09	×	○	○	Adjusts BV MID KEY
	B10	BLUE 10	×	○	○	Adjusts BV MID S-KEY
	B11	BLUE 11	×	○	○	Adjusts BV 5D SKEW
	B12	BLUE 12	×	○	○	Adjusts BV BOW
	B13	BLUE 13	×	○	○	Adjusts BV PIN
	B14	BLUE 14	×	○	○	Adjusts BV SUB PIN
	B15	BLUE 15	×	○	○	Adjusts BV MID PIN
	B16	BLUE 16	×	○	○	Adjusts BV MID S-PIN
	B17	BLUE 17	×	○	○	Adjusts BV 6D BOW
	B18	BLUE 18	×	○	○	Adjusts BV 3D SKEW
	B19	BLUE 19	×	○	○	Adjusts BV 3D KEY
	B20	BLUE 20	×	○	○	Adjusts BV 3D SUB KEY
	B21	BLUE 21	×	○	○	Adjusts BV MID 3D KEY
	B22	BLUE 22	×	○	○	Adjusts BV MID 3D S-KEY
	B23	BLUE 23	×	○	○	Adjusts BV 5D SIZE
	B24	BLUE 24	×	○	○	Adjusts BV 4D BOW
	B25	BLUE 25	×	○	○	Adjusts BV 4D PIN
	B26	BLUE 26	×	○	○	Adjusts BV 4D SUB PIN
	B27	BLUE 27	×	○	○	Adjusts BV MID 4D PIN
	B28	BLUE 28	×	○	○	Adjusts BV MID 4D S-PIN
	B29	BLUE 29	×	○	○	Adjusts BV 6D LIN
	B30	BLUE 30	×	○	○	Adjusts BH STATIC
	B31	BLUE 31	×	○	○	Adjusts BH SKEW
	B32	BLUE 32	×	○	○	Adjusts BH BOW
	B33	BLUE 33	×	○	○	Adjusts BH 3D SKEW
	B34	BLUE 34	×	○	○	Adjusts BH 4D BOW
	B36	BLUE 36	×	○	○	Adjusts BH SIZE
	B37	BLUE 37	×	○	○	Adjusts BH KEY
	B38	BLUE 38	×	○	○	Adjusts BH PIN

	Command	Name	Normal Valid	Number Direct	UP/DW Command	Function
	B39	BLUE 39	×	○	○	Adjusts BH 3D KEY
	B40	BLUE 40	×	○	○	Adjusts BH 4D PIN
	B41	BLUE 41	×	○	○	Adjusts BH 5D SIZE
	B42	BLUE 42	×	○	○	Adjusts BH LINEARITY
	B43	BLUE 43	×	○	○	Adjusts BH SUB KEY
	B44	BLUE 44	×	○	○	Adjusts BH SUB PIN
	B45	BLUE 45	×	○	○	Adjusts BH 3D S-KEY
	B46	BLUE 46	×	○	○	Adjusts BH 4D S-PIN
	B47	BLUE 47	×	○	○	Adjusts BH 6D LIN
	B48	BLUE 48	×	○	○	Adjusts BH MID SIZE
	B49	BLUE 49	×	○	○	Adjusts BH MID KEY
	B50	BLUE 50	×	○	○	Adjusts BH MID PIN
	B51	BLUE 51	×	○	○	Adjusts BH MID 3D KEY
	B52	BLUE 52	×	○	○	Adjusts BH MID 4D PIN
	B53	BLUE 53	×	○	○	Adjusts BH 5D SKEW
	B54	BLUE 54	×	○	○	Adjusts BH MID LIN
	B55	BLUE 55	×	○	○	Adjusts BH MID SUB KEY
	B56	BLUE 56	×	○	○	Adjusts BH MID SUB PIN
	B57	BLUE 57	×	○	○	Adjusts BH MID 3D S-KEY
	B58	BLUE 58	×	○	○	Adjusts BH MID 4D S-PIN
	B59	BLUE 59	×	○	○	Adjusts BH 6D BOW
	B61	P-CONV. ADJ 61	×	×	(Note 2)	Adjusts BLUE point convergence
	B62	P-CONV. ADJ 62	×	×	(Note 2)	Adjusts BLUE point convergence
	B63	P-CONV. ADJ 63	×	×	(Note 2)	Adjusts BLUE point convergence
	B64	P-CONV. ADJ 64	×	×	(Note 2)	Adjusts BLUE point convergence
	B65	P-CONV. ADJ 65	×	×	(Note 2)	Adjusts BLUE point convergence
	B71	P-CONV. ADJ 71	×	×	(Note 2)	Adjusts BLUE point convergence
	B72	P-CONV. ADJ 72	×	×	(Note 2)	Adjusts BLUE point convergence
	B73	P-CONV. ADJ 73	×	×	(Note 2)	Adjusts BLUE point convergence
	B74	P-CONV. ADJ 74	×	×	(Note 2)	Adjusts BLUE point convergence
	B75	P-CONV. ADJ 75	×	×	(Note 2)	Adjusts BLUE point convergence
	B81	P-CONV. ADJ 81	×	×	(Note 2)	Adjusts BLUE point convergence
	B82	P-CONV. ADJ 82	×	×	(Note 2)	Adjusts BLUE point convergence
	B83	P-CONV. ADJ 83	×	×	(Note 2)	Adjusts BLUE point convergence
	B84	P-CONV. ADJ 84	×	×	(Note 2)	Adjusts BLUE point convergence
	B85	P-CONV. ADJ 85	×	×	(Note 2)	Adjusts BLUE point convergence
	B91	P-CONV. ADJ 91	×	×	(Note 2)	Adjusts BLUE point convergence
	B92	P-CONV. ADJ 92	×	×	(Note 2)	Adjusts BLUE point convergence
	B93	P-CONV. ADJ 93	×	×	(Note 2)	Adjusts BLUE point convergence
	B94	P-CONV. ADJ 94	×	×	(Note 2)	Adjusts BLUE point convergence
	B95	P-CONV. ADJ 95	×	×	(Note 2)	Adjusts BLUE point convergence
	BA1	P-CONV. ADJ A1	×	×	(Note 2)	Adjusts BLUE point convergence
	BA2	P-CONV. ADJ A2	×	×	(Note 2)	Adjusts BLUE point convergence
	BA3	P-CONV. ADJ A3	×	×	(Note 2)	Adjusts BLUE point convergence
	BA4	P-CONV. ADJ A4	×	×	(Note 2)	Adjusts BLUE point convergence
	BA5	P-CONV. ADJ A5	×	×	(Note 2)	Adjusts BLUE point convergence
	BP1	P-CONV. ADJ P1	×	×	(Note 2)	Adjusts BLUE point convergence

	Command	Name	Normal Valid	Number Direct	UP/DW Command	Function
B	BP2	P-CONV. ADJ P2	×	×	(Note 2)	Adjusts BLUE point convergence
	BP3	P-CONV. ADJ P3	×	×	(Note 2)	Adjusts BLUE point convergence
	BP4	P-CONV. ADJ P4	×	×	(Note 2)	Adjusts BLUE point convergence
	BP5	P-CONV. ADJ P5	×	×	(Note 2)	Adjusts BLUE point convergence
	BP6	P-CONV. ADJ P6	×	×	(Note 2)	Adjusts BLUE point convergence
	BP7	P-CONV. ADJ P7	×	×	(Note 2)	Adjusts BLUE point convergence
	BP8	P-CONV. ADJ P8	×	×	(Note 2)	Adjusts BLUE point convergence
	BP9	P-CONV. ADJ P9	×	×	(Note 2)	Adjusts BLUE point convergence
	BP0	P-CONV. ADJ P9	×	×	(Note 2)	Adjusts BLUE point convergence
	BR1	BAUD RATE 1	×	×	×	Sets RS-232C baud rate to 1200 BPS
	BR2	BAUD RATE 2	×	×	×	Sets RS-232C baud rate to 2400 BPS
	BR3	BAUD RATE 3	×	×	×	Sets RS-232C baud rate to 4800 BPS
	BR4	BAUD RATE 4	×	×	×	Sets RS-232C baud rate to 9600 BPS
	BR5	BAUD RATE 5	×	×	×	Sets RS-232C baud rate to 19200 BPS
	BHI	BLUE HIGH LIGHT	×	○	○	Adjusts BLUE HIGH-LIGHT
	BLW	BLUE LOW LIGHT	×	○	○	Adjusts BLUE LOW-LIGHT
	BOF	BLUE OFF	×	×	×	Turns OFF BLUE
	BON	BLUE ON	×	×	×	Turns ON BLUE
	BRT	BRIGHTNESS	×	○	○	Adjusts BRIGHTNESS
C	CBN	COMBINATION NO	○	×	×	Turns OFF ABL operation link
	CBY	COMBINATION YES	○	×	×	Turns ON ABL operation link
	CM1	COLOR MODE 1	○	×	×	Sets white balance data to color mode 1
	CM2	COLOR MODE 2	○	×	×	Sets white balance data to color mode 2
	CNT	CONTRAST	×	○	○	Adjusts CONTRAST
	COL	COLOR	×	○	○	Adjusts COLOR (Note 3)
	COF	COLOR OFF	×	×	×	Turns OFF COLOR (Note 3)
	CON	COLOR ON	×	×	×	Turns ON COLOR (Note 3)
	C12	CONV. DATA COPY 1→2	×	×	×	Copy Convergence data MEMO-1 to 2
	C13	CONV. DATA COPY 1→3	×	×	×	Copy Convergence data MEMO-1 to 3
	C21	CONV. DATA COPY 2→1	×	×	×	Copy Convergence data MEMO-2 to 1
	C23	CONV. DATA COPY 2→3	×	×	×	Copy Convergence data MEMO-2 to 3
	C31	CONV. DATA COPY 3→1	×	×	×	Copy Convergence data MEMO-3 to 1
	C32	CONV. DATA COPY 3→2	×	×	×	Copy Convergence data MEMO-3 to 2
D	DOF	DISPLAY OFF	×	×	×	Turns OFF OSD display
	DW0	DOWN 10	×	×	×	Decreases adjusting value by 10
	DWn	DOWN n	×	×	×	Decreases adjusting value by n
	DWF	DOWN FULL	×	×	×	Minimizes adjusting value
	DIY	OSD DISP. YES	×	×	×	Enables OSD display
	DIN	OSD DISP. NO	×	×	×	Disables OSD display
G	G00	GREEN 00	×	○	○	GREEN convergence adjustment
	|	|				(Same as BLUE)
	G59	GREEN 59				

	Com-mand	Name	Normal Valid	Number Direct	UP/DW Command	Function
G	G61 | GP0	P-CONV. ADJ 61 | P-CONV. ADJ P0	×	○	○	GREEN point convergence adjustment (Same as BLUE)
	GHI	GREEN HIGH-LIGHT	×	○	○	Adjusts GREEN HIGH-LIGHT
	GLW	GREEN LOW-LIGHT	×	○	○	Adjusts GREEN LOW-LIGHT
	GON	GREEN ON	×	×	×	Turns ON GREEN
	GOF	GREEN OFF	×	×	×	Turns OFF GREEN
	GGH	GET GH CONV DATA	×	×	×	Calls GH convergence adjusting data (For each mode)
	GGV	GET GV CONV DATA	×	×	×	Calls GV convergence adjusting data (For each mode)
	GRH	GET RH CONV DATA	×	×	×	Calls RH convergence adjusting data (For each mode)
	GRV	GET RV CONV DATA	×	×	×	Calls RV convergence adjusting data (For each mode)
	GBH	GET BH CONV DATA	×	×	×	Calls BH convergence adjusting data (For each mode)
	GBV	GET BV CONV DATA	×	×	×	Calls BV convergence adjusting data (For each mode)
	GDD	GET DEF DATA	×	×	×	Calls the main deflection adjusting data for each mode
	GWB	GET W/B DATA	×	×	×	Calls the white balance adjusting data for each mode
	GUS	GET CNV SEL DATA	×	×	×	Calls the current state of the convergence data
	GST	GET STATUS DATA	×	×	×	Calls the various setting states
H	HPI	H PIN	×	○	○	Adjusts H deflection PIN
	HSI	H SIZE	×	○	○	Adjusts H deflection SIZE
	HBL	H BLK-L	×	○	○	BLK width adjustment for forming convergence correction waveform (Left)
	HBR	H BLK-R	×	○	○	BLK width adjustment for forming convergence correction waveform (Right)
I	IDS	ID SET	×	×	×	Sets ID
	IDC	ID CLEAR	×	×	×	Clears ID
	IN1	INPUT 1	○	×	×	Selects video input
	IN2	INPUT 2	○	×	×	Selects Y/C input
	IN3	INPUT 3	○	×	×	Selects RGB input
L	LOR	LIGHT ONLY RED	×	×	×	Displays only RED
	LOG	LIGHT ONLY GREEN	×	×	×	Displays only GREEN
	LOB	LIGHT ONLY BLUE	×	×	×	Displays only BLUE
	LWT	LINEAR WHITE	×	○	○	Adjusts LINEAR WHITE
M	MLY	MULTI YES	○	×	×	Turns ON peripheral light amount correction
	MLN	MULTI NO	○	×	×	Turns OFF peripheral light amount correction

	Command	Name	Normal Valid	Number Direct	UP/DW Command	Function
N	NTS	TV SYSTEM NTSC	○	×	×	Sets TV SYSTEM to NTSC (Note 4)
P	PON	POWER ON	○	×	×	Turns ON power
	POF	POWER OFF	○	×	×	Turns OFF power
	POC	POWER ON(MUTE)	○	×	×	Turns ON power with the convergence DAC muted
	PAL	TV SYSTEM PAL	○	×	×	Sets TV SYSTEM to PAL (Note 4)
R	R00	RED 00	×	○	○	RED convergence adjustment
	|	|				(Same as BLUE)
	R59	RED 59				
	R61	P-CONV. ADJ 61	×	○	○	RED point convergence adjustment
	|	|				(Same as BLUE)
	RP0	P-CONV. ADJ P0				
	RHI	RED HIGH LIGHT	×	○	○	RED HIGH-LIGHT adjustment
	RLW	RED LOW LIGHT	×	○	○	RED LOW-LIGHT adjustment
	RON	RED ON	×	×	×	Turns ON RED
	ROF	RED OFF	×	×	×	Turns OFF RED
S	SHP	SHARPNESS	×	○	○	Adjusts SHARPNESS (Note 6)
	STD	STD W/B DATA	×	×	×	Re-writes white balance adjusting data in factory memory
	STC	STD CONV DATA	×	×	×	Re-writes convergence adjusting data in factory memory
	SW1	SWITCH MENU 1	×	×	×	Displays various settings in OSD
T	TNT	TINT	×	○	○	Adjusts TINT (Note 5)
	TS1	TEST CROSS 1	×	×	×	Displays test cross (Pattern 1)
	TVA	TV SYSTEM AUTO	○	×	×	Sets TV SYSTEM mode to auto mode (Note 4)
U	UP0	UP 10	×	×	×	Increases adjusting value by 10
	UPn	UP n	×	×	×	Increases adjusting value by n
	UPF	UP FULL	×	×	×	Maximizes adjusting value
	US1	USER 1	○	×	×	Switches convergence adjusting data to user 1 (Note 4)
	US2	USER 2	○	×	×	Switches convergence adjusting data to user 2 (Note 4)
	US3	USER 3	○	×	×	Switches convergence adjusting data to user 3 (Note 4)

	Command	Name	Normal Valid	Number Direct	UP/DW Command	Function
V	VSI	V SIZE	○	×	×	Adjusts V deflection SIZE
	VLI	V LINEARITY	○	×	×	Adjusts V deflection LIN
	VST	V STATIC	○	×	×	Adjusts V deflection STATIC
	VMS	V MID SIZE	○	×	×	Adjusts V deflection MID SIZE
	VML	V MID LINEARITY	○	×	×	Adjusts V deflection MID LIN
	VMY	VIDEO MUTE ON	×	×	×	Sets video mute to ON when the input function switches
	VMN	VIDEO MUTE OFF	×	×	×	Sets video mute to OFF when the input function switches

Note 1 : The ABL command is valid only in the ABL combination ON (CBY) state.

Note 2 : The UP/DOWN commands that can be used for the point convergence adjustment are as follow.
Move up→UP1
Move down→DW1
Move to right→RI1
Move to left→LE1
Adjustment of each area use the commands as follow.
File area adjustment——RI1 and LE1 are available.
Command name : RP☐, GP☐, BP☐ (☐ ; 2, 4, 6, 8, 0)
Line area adjustment——UP1 and DW1 are available.
Command name : RP☐, GP☐, BP☐ (☐ ; 1, 3, 5, 7, 9)

Note 3 : The COL, CON, and COF commands are not valid during RGB input.

Note 4 : The TV SYSTEM selection command and convergence adjustment data memory area selection command can be set separately for when the input function is set to VIDEO or Y/C and when it is set to RGB.

Note 5 : The TNT commands are not valid during RGB input. Neither valid during PAL input besides RGB.

Note6 : The SHP commands are not valid during RGB input.

<Meanings of the command table>

- Normal valid

  Command which can be used only when the adjustment mode is set using a command.
  ○; Receive a command regardless of AJY/AJN
  ×; Receive a command AJY

- Number direct

  Command which can directly be specified as the adjusting value when added with 000 to 255.
  ○; The value provided is a direct command. (Example : For CNT070, the contrast is set to 70.)
  ×; Not a Numeral direct command. (Example : For IN1128, only IN1 is executed.)

- UP/DW command

  A command which manipulates the adjustment value for the value UPn/ DWn (n is an arbitrary number between 0 to 9 and F) provided after the command.

③ LIST OF GET COMMANDS

What are GET Commands?

- Commands which output adjustment data, etc. from Multi projection unit microprocessor to the PC.
- The adjustment data is output for every mode.

Example 1)When <GGH> command is set when CONV.DATA MEMO-1 is selected, the GREEN horizontal convergence data of MEMO-1 will be get. In the same way, when <GGH> command is set when CONV.DATA MEMO 2 to 3 are selected, the GREEN horizontal convergence data of MEMO-2 to 3 will be get.

Example 2)When <GWB> command is set when COLOR MODE =1 and at the same time, INPUT=RGB, the W/B DATA for COLOR MODE=1 and INPUT=RGB will be get.

- Only valid for one ID. (Invalid for ID=**, 1*, *1, etc.)
- The adjustment data, etc. is output in ASCII codes.

Note)< > indicates the command name.

[1] <GRH> (GET RH CONV.DATA)=RED horizontal convergence data is output.
<GGH> (GET GH CONV.DATA)=GREEN horizontal convergence data is output.
<GBH> (GET BH CONV.DATA)=BLUE horizontal convergence data is output.

Format:Output in the following order.

①STX (02H)		
②<☐30>/☐H STATIC	adjustment data	(3 BYTE)
③<☐31>/☐H SKEW	adjustment data	(3 BYTE)
④<☐32>/☐H BOW	adjustment data	(3 BYTE)
⑤<☐36>/☐H SIZE	adjustment data	(3 BYTE)
⑥<☐42>/☐H LINEARITY	adjustment data	(3 BYTE)
⑦<☐37>/☐H KEY	adjustment data	(3 BYTE)
⑧<☐43>/☐H SUB KEY	adjustment data	(3 BYTE)
⑨<☐38>/☐H PIN	adjustment data	(3 BYTE)
⑩<☐44>/☐H SUB PIN	adjustment data	(3 BYTE)
⑪<☐33>/☐H 3D SKEW	adjustment data	(3 BYTE)
⑫<☐34>/☐H 4D BOW	adjustment data	(3 BYTE)
⑬<☐53>/☐H 5D SKEW	adjustment data	(3 BYTE)
⑭<☐59>/☐H 6D BOW	adjustment data	(3 BYTE)
⑮<☐48>/☐H MID SIZE	adjustment data	(3 BYTE)
⑯<☐54>/☐H MID LIN	adjustment data	(3 BYTE)
⑰<☐44>/☐H 5D SIZE	adjustment data	(3 BYTE)
⑱<☐47>/☐H 6D LIN	adjustment data	(3 BYTE)
⑲<☐44>/☐H 3D KEY	adjustment data	(3 BYTE)
⑳<☐45>/☐H 3D S-KEY	adjustment data	(3 BYTE)
㉑<☐40>/☐H 4D PIN	adjustment data	(3 BYTE)
㉒<☐46>/☐H 4D S-PIN	adjustment data	(3 BYTE)
㉓<☐49>/☐H MID KEY	adjustment data	(3 BYTE)
㉔<☐55>/☐H MID S-KEY	adjustment data	(3 BYTE)
㉕<☐50>/☐H MID PIN	adjustment data	(3 BYTE)
㉖<☐56>/☐H MID S-PIN	adjustment data	(3 BYTE)
㉗<☐51>/☐H MID 3D KEY	adjustment data	(3 BYTE)
㉘<☐57>/☐H MID 3D S-KEY	adjustment data	(3 BYTE)
㉙<☐52>/☐H MID 4D PIN	adjustment data	(3 BYTE)
㉚<☐58>/☐H MID 4D S-PIN	adjustment data	(3 BYTE)
㉛ETX (03H)		

Note ☐:R or G or B

[2] <GRV> (GET RV CONV.DATA)=RED horizontal convergence data is output.
<GGV> (GET GV CONV.DATA)=GREEN horizontal convergence data is output.
<GBV> (GET BV CONV.DATA)=BLUE horizontal convergence data is output.

Format:Output in the following order.

①STX (02H)		
②<☐00>/☐V STATIC	adjustment data	(3 BYTE)
③<☐06>/☐V SKEW	adjustment data	(3 BYTE)
④<☐12>/☐V BOW	adjustment data	(3 BYTE)
⑤<☐01>/☐V SIZE	adjustment data	(3 BYTE)
⑥<☐02>/☐V LINEARITY	adjustment data	(3 BYTE)
⑦<☐07>/☐V KEY	adjustment data	(3 BYTE)
⑧<☐08>/☐V SUB KEY	adjustment data	(3 BYTE)
⑨<☐13>/☐V PIN	adjustment data	(3 BYTE)
⑩<☐14>/☐V SUB PIN	adjustment data	(3 BYTE)
⑪<☐18>/☐V 3D SKEW	adjustment data	(3 BYTE)
⑫<☐24>/☐V 4D BOW	adjustment data	(3 BYTE)
⑬<☐11>/☐V 5D SKEW	adjustment data	(3 BYTE)
⑭<☐17>/☐V 6D BOW	adjustment data	(3 BYTE)
⑮<☐03>/☐V MID SIZE	adjustment data	(3 BYTE)
⑯<☐04>/☐V MID LIN	adjustment data	(3 BYTE)
⑰<☐23>/☐V 5D SIZE	adjustment data	(3 BYTE)
⑱<☐29>/☐V 6D LIN	adjustment data	(3 BYTE)
⑲<☐19>/☐V 3D KEY	adjustment data	(3 BYTE)
⑳<☐20>/☐V 3D S-KEY	adjustment data	(3 BYTE)
㉑<☐25>/☐V 4D PIN	adjustment data	(3 BYTE)
㉒<☐26>/☐V 4D S-PIN	adjustment data	(3 BYTE)
㉓<☐09>/☐V MID KEY	adjustment data	(3 BYTE)
㉔<☐10>/☐V MID S-KEY	adjustment data	(3 BYTE)
㉕<☐15>/☐V MID PIN	adjustment data	(3 BYTE)
㉖<☐16>/☐V MID S-PIN	adjustment data	(3 BYTE)
㉗<☐21>/☐V MID 3D KEY	adjustment data	(3 BYTE)
㉘<☐22>/☐V MID 3D S-KEY	adjustment data	(3 BYTE)
㉙<☐27>/☐V MID 4D PIN	adjustment data	(3 BYTE)
㉚<☐28>/☐V MID 4D S-PIN	adjustment data	(3 BYTE)
㉛ETX (03H)		

Note ☐:R or G or B

[3] <GDD> (GET DEFLECTION DATA)=Deflection adjusting data is output.

Format:Output in the following order.

①STX (02 H)		
②<HSI>/ H SIZE	adjustment data	(3 BYTE)
③<VST>/ V STATIC	adjustment data	(3 BYTE)
④<VSI>/ V SIZE	adjustment data	(3 BYTE)
⑤<VLI>/ V LINEARITY	adjustment data	(3 BYTE)
⑥<VMS>/ V MID SIZE	adjustment data	(3 BYTE)
⑦<VML>/ H MID LINEARITY	adjustment data	(3 BYTE)
⑧<HBL>/ H BLK-L	adjustment data	(3 BYTE)
⑨<HBR>/ H BLK-R	adjustment data	(3 BYTE)
⑩<HPI>/ H PIN	adjustment data	(3 BYTE)
⑪ETX (03 H)	adjustment data	(3 BYTE)

[4] <GWB> (GET W/B DATA)=White balance adjustment data is output.

Format:Output in the following order.

①STX (02H)

②<LWT>/ LINEAR WHITE	adjustment data	(3 BYTE)
③<CNT>/CONTRAST	adjustment data	(3 BYTE)
④<BRT>/BRIGHTNESS	adjustment data	(3 BYTE)
⑤<COL>/COLOR	adjustment data	(3 BYTE) Note 1)
⑥<TNT>/TINT	adjustment data	(3 BYTE) Note 1) and Note 3)
⑦<BLW>/BLUE LOW-LIGHT	adjustment data	(3 BYTE)
⑧<GLW>/GREEN LOW-LIGHT	adjustment data	(3 BYTE)
⑨<RLW>/RED LOW-LIGHT	adjustment data	(3 BYTE)
⑩<BHI>/BLUE HIGH-LIGHT	adjustment data	(3 BYTE)
⑪<GHI>/GREEN HIGH-LIGHT	adjustment data	(3 BYTE)
⑫<RHI>/RED HIGH-LIGHT	adjustment data	(3 BYTE)
⑬<SHP>/SHARPNESS	adjustment data	(3 BYTE) Note 1) and Note 5)
⑭<ABL>/ABL LEVEL	adjustment data	(3 BYTE) Note 2) and Note 4)
⑮<ABG>/ABL GAIN	adjustment data	(3 BYTE) Note 2)

⑯ETX (03H)

Note 1)Dummy when INPUT=RGB

Note 2)No dependent on mode. (Has one data.)

Note 3)Dummy when PAL signal is input. (INPUT=VIDEO or Y/C)

Note 4)Dummy when COMBINATION=OFF (Data is output when COMBINATION=ON)

Note 5)SHARPNESS data for OFF is output when MULTI=OFF, and SHARPNESS data for ON is output when MULTI=ON.

[5] <GUS> (GET CONV. USER DATA)=Deflection and convergence data memory area setting state is output.

①STX (02H)

②Memory area selected when INPUT=VIDEO or Y/C & input signal=NTSC. (3 BYTE)
Example)US 1:Indicates CONV.MEMO-1 is selected.

③Memory area selected when INPUT=VIDEO or Y/C & input signal=PAL (Or other than NTSC, containing no signals). (3 BYTE)
Example)US 2:Indicates CONV.MEMO-2 is selected.

④Memory area selected when INPUT=RGB & input signal=NTSC. (3 BYTE)
Example)US 1:Indicates CONV.MEMO-1 is selected.

⑤Memory area selected when INPUT=RGB & input signal=PAL (or other than NTSC, containing no signals). (3 BYTE)
Example)US 2:Indicates CONV.MEMO-2 is selected.

⑥ETX (03H)

[6] <GST> (GET STATUS)=Various setting states are output.

①STX (02H)

②Version of microcomputer software (5 BYTE)
Example)V1.00:Indicates VERSION 1.00.

③Input function state (3 BYTE)-Output in command name.
Example)IN1:Indicates VIDEO input.

④MULTI state (3 BYTE)-Output in command name.
Example)MLY:Indicates MULTI=ON.

⑤COLOR MODE state (3 BYTE)-Output in command name.
Example)CM1:Indicates COLOR MODE=1.

⑥COMBINATION state (3 BYTE)-Output in command name.
Example)CMY:Indicates COMBINATION=ON.

⑦TV SYSTEM MODE state (3 BYTE)-Output in command name. (Note 1)
Example)TVA:Indicates TV SYSTEM=AUTO.

⑧Indicates the input discriminating result of TV SYSTEM=AUTO (Note 2)
Example)NTS:Input discriminating result indicates NTSC.

⑨Deflection and convergence data memory area state (3 BYTE) (Note 1)
US1:Indicates that CONV.MEMO-1 is selected.
US2:Indicates that CONV.MEMO-2 is selected.
US3:Indicates that CONV.MEMO-3 is selected.

⑩OSD display, enable/disable setting state (3 BYTE)-Output in command name.
Example)DIY:Indicates OSD display enabled.

⑪ETX (03H)

Note 1)When INPUT=VIDEO or Y/C, the VIDEO or Y/C input setting is output.
When INPUT=RGB, the RGB input setting is output.

Note 2)If it does not TV SYSTEM=AUTO, mode will output the same state of ⑦ TV SYSTEM.

④ PRECAUTIONS

[1] The adjusted data is backed up by the AJN command.After adjustments, always perform AJN. AJN will also exit the screen adjustment display.

[2] Contents of the INPUT FUNCTION, MULTI ON/OFF, COMBINATION ON/OFF, COLOR MODE 1/2, TV SYSTEM, CONV.MEMORY are memorized only when the power is turned OFF using the remote control, POF command, or the TACT switch on the rear panel, and finish the adjustment mode (if you were set each data in the adjustment mode).
(They will not be memorized by AC ON/OFF.)
When starting up/stopping the system by AC ON/OFF under the long term installation conditions, memorize the contents before executing AC ON/OFF.

[3]There is a limit to the RS-232C communication buffer in the unit. If too many commands are sent at once, it will not operate properly.

[4] The RS-232C command excecution time.
When sending RS-232C command, send the next command after minimum 500m sec.
Especially, the following commands need more than 500msec.
a) The assigned command of the POINT CONVERGENCE ADJUST POINT
1.5sec
b) IN1~3 (Input switching)
1sec
c) TVA,NTS,PAL (TV system setting)
1sec

If the next commands are sent before these time, they may not be received. Care when making programs like the direction.

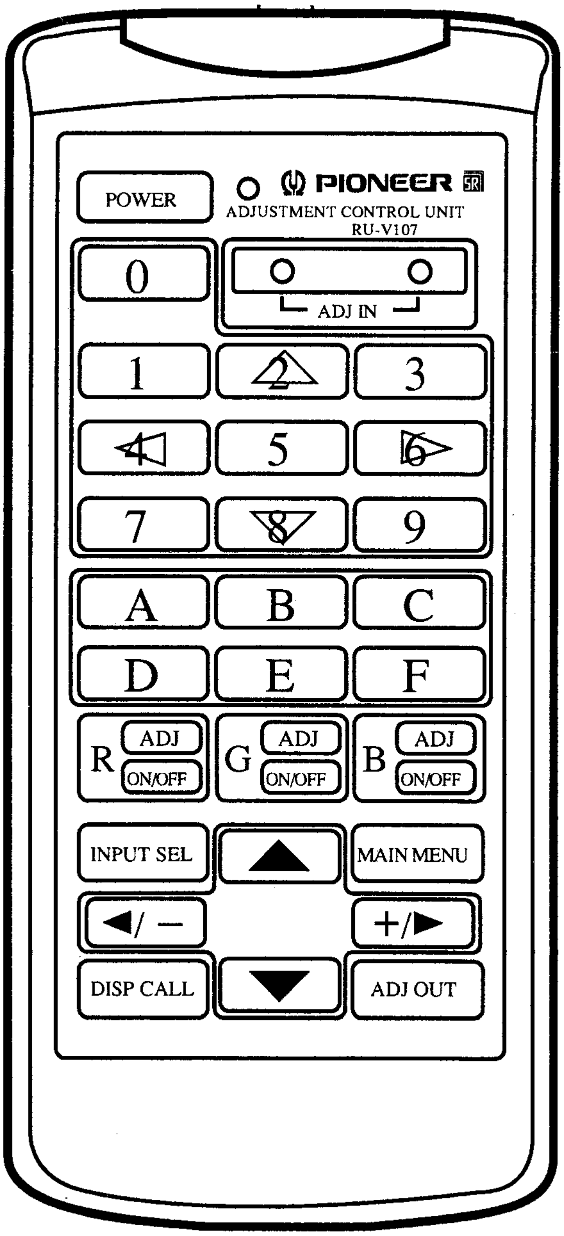
[5] Exiting the personal computer adjustment mode
The personal computer adjustment mode is automatically exited when the following steps are performed.
a) When the rear panel switch is set.
b) When the power is turned OFF.
c) When the input signal is switched, the cable is disconnected, or the mode is switched: NTSC ⇔ PAL.
(However, in some cases, switching between PAL and no-signal may not exit the mode.)

To continue adjustments, set the re-adjustment mode again.

8.4 Adjustments by Remote Control

Multi projection unit adjustments can be performed using the remote control (RU-V107) besides the computerand software.
All adjustments are performed only using the remote control.
Up to 16 units can be operated using the remote control unit at one time using the link cable.

① **Remote control functions.**


POWER
PIONEER
ADJUSTMENT CONTROL UNIT
RU-V107
0
ADJ IN
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
R
ADJ
ON/OFF
G
ADJ
ON/OFF
B
ADJ
ON/OFF
INPUT SEL
MAIN MENU
◀/ –
+/▶
DISP CALL
ADJ OUT

1) POWER

- Turns on/off the power of the unit.

2) 0

<Adjustment Mode>

- Selects ID CLEAR in the ID SET/CLEAR/SELECT MODE. Also selects "0" for ID SET and ID SELECT.
- Selects V STATIC in the DEFLECTION ADJUST MODE.
- Selects ABL GAIN in the WHITE BALANCE ADJUST MODE.
- Ciclically selects the adjustment items in the POINT CONVER ADJUST MODE in the following order.

→ POINT adjustment → File area → Line area ↵

3, 4) ○ ○ ADJ IN

- Starts up the adjustment mode when the two buttons are pressed simultaneously.

5) 1

<Adjustment Mode>

- Selects 1 (ID SET/SELECT/CLEAR MODE) of the main menu of the adjustment mode.
- Sets ID SET in the ID SET/CLEAR/SELECT MODE. Also selects "1" for ID SET and ID SELECT.
- Selects STATIC in the CONVERGENCE ADJUST MODE.
- Selects CONTRAST in the WHITE BALANCE ADJUST MODE.
- Returns the CONVERGENCE ADJUST DATA to the factory set data in the MEMORY READ/COPY MODE.
- Select the pattern (1→2) for copying the convergence data between memories in the MEMORY READ/COPY MODE.

6) △

<Adjustment Mode>

- Selects 2 (OPERATION MODE) of the main menu of the adjustment mode.
- Sets ID SELECT in the ID SET/CLEAR/SELECT MODE. Also selects "2" for ID SET and ID SELECT.
- Cyclically selects the input function in the OPERATION MODE in the following order.

→ VIDEO → Y/C → RGB ↵

- Selects the V SIZE in the DEFLECTION ADJUST MODE.
- Cyclically selects the item to be adjusted in the CONVERGENCE ADJUST MODE in the following order.

→ SIZE → MID SIZE → 5D SIZE ↵

- Moves the point to be adjusted up in the POINT CONVER ADJUST MODE.
- Selects BRIGHTNESS in the WHITE BALANCE ADJUST MODE.
- Returns the WHITE BALANCE ADJUST DATA to the factory set data in the MEMORY READ/COPY MODE.
- Select the pattern (1→3) for copying the convergence data between memories in the MEMORY READ/COPY MODE.

7) 3

<Adjustment Mode>

- Selects 3 (DEFLECTION ADJUST MODE) of the main menu of the adjustment mode.
- Selects "3" for ID SET and ID SELECT in the ID SET/CLEAR/SELECT MODE.
- Cyclically switches MULTI ON/OFF in the OPERATION MODE.
- Selects V MID SIZE in the DEFLECTION ADJUST MODE.
- Cyclically selects the item to be adjusted in the CONVERGENCE ADJUST MODE in the following order.

→ LINEARITY → MID LINEARITY → 6D LINEAR ↵

- Selects COLOR in the WHITE BALANCE ADJUST MODE(,only invalid for RGB input).
- Reset the various setting value in the MEMORY READ/COPY MODE.
- Select the pattern (2→1) for copying the convergence data between memories in the MEMORY READ/COPY MODE.

8) ◁

<Adjustment Mode>

- Selects 4 (CONVERGENCE ADJUST MODE) of the main menu of the adjustment mode.
- Selects "4" for ID SET and ID SELECT in the ID SET/CLEAR/SELECT MODE.
- Cyclically switches COLOR MODE 1/2 in the OPERATION MODE.
- Cyclically selects the item to be adjusted in the CONVERGENCE ADJUST MODE in the following order.

→ SKEW → 3D SKEW → 5D SKEW ↵

- Moves the point to be adjusted to the left in the POINT CONVER ADJUST MODE.
- Selects TINT in the WHITE BALANCE ADJUST MODE(,only invalid for RGB and PAL signal input).
- Select the pattern (2→3) for copying the convergence data between memories in the MEMORY READ/COPY MODE.

9) 5

<Adjustment Mode>

- Selects 5 (POINT CONVERGENCE ADJUST MODE) of the main menu of the adjustment mode.
- Selects "5" for ID SET and ID SELECT in the ID SET/CLEAR/SELECT MODE.
- Cyclically switches COMBINATION ON/OFF in the OPERATION MODE.
- Selects H SIZE in the DEFLECTION ADJUST MODE.
- Cyclically selects the item to be adjusted in the CONVERGENCE ADJUST MODE in the following order.

→ KEY → MID KEY → 3D KEY → MID 3D KEY ↵

- Selects SHARPNESS in the WHITE BALANCE ADJUST MODE(,only invalid for RGB input).
- Select the pattern (3→1) for copying the convergence data between memories in the MEMORY READ/COPY MODE.

10) [6▷]

<Adjustment Mode>

- Selects 6 (WHITE BALANCE ADJUST MODE) of the main menu of the adjustment mode.
- Selects "6" for ID SET and ID SELECT in the ID SET/CLEAR/ SELECT MODE.
- Cyclically switches VIDEO MUTE ON/OFF in the OPERATION MODE.
- Selects V LINEARITY in the DEFLECTION ADJUST MODE.
- Cyclically selects the item to be adjusted in the CONVERGENCE ADJUST MODE in the following order.

→ SUB KEY → MID SUB KEY → 3D SUB KEY
MID 3D SUB KEY ←

- Moves the point to be adjusted to the right in the POINT CONVER ADJUST MODE.
- Selects LINEAR WHITE in the WHITE BALANCE ADJUST MODE.
- Select the pattern (3→2) for copying the convergence data between memories in the MEMORY READ/COPY MODE.

11) [7]

<Adjustment Mode>

- Selects 7 (MEMORY READ MODE) of the main menu of the adjustment mode.
- Selects "7" for ID SET and ID SELECT in the ID SET/CLEAR/ SELECT MODE.
- Cyclically selects the RS-232C baud rate in the OPERATION MODE in the following order.

→ 1200 → 2400 → 4800 → 9600 → 19200

- Selects H BLK-L in the DEFLECTION ADJUST MODE.
- Cyclically selects the item to be adjusted in the CONVERGENCE ADJUST MODE in the following order.

→ BOW → 4D BOW → 6D BOW

- Selects RED HIGHLIGHT in the WHITE BALANCE ADJUST MODE.

12) [8▽]

<Adjustment Mode>

- Selects "8" for ID SET and ID SELECT in the ID SET/CLEAR/ SELECT MODE.
- Cyclically selects TV SYSTEM in the OPERATION MODE in the following order.

→ AUTO → NTSC → PAL

- Cyclically selects the item to be adjusted in the CONVERGENCE ADJUST MODE in the following order.

→ PIN → MID PIN → 4D PIN → MID 4D PIN

- Moves the point to be adjusted down in the POINT CONVER ADJUST MODE.
- Selects GREEN HIGH-LIGHT in the WHITE BALANCE ADJUST MODE.
- Selects H BLK-R in the DEFLECTION ADJUST MODE.

13) [9]

<Adjustment Mode>

- Selects "9" for ID SET and ID SELECT in the ID SET/CLEAR/ SELECT MODE.
- Cyclically selects TV SYSTEM in the OPERATION MODE in the following order.

→ 1 → 2 → 3

- Selects V MID LINEARITY in the DEFLECTION ADJUST MODE.
- Cyclically selects the item to be adjusted in the CONVERGENCE ADJUST MODE in the following order.

→ SUB PIN → MID SUB PIN → 4D SUB PIN → MID 4D SUB PIN

- Selects BLUE HIGH-LIGHT in the WHITE BALANCE ADJUST MODE.

14) [A]

<Adjustment Mode>

- Selects "A" for ID SET and ID SELECT in the ID SET/CLEAR/ SELECT MODE.
- Subtracts 10 from the current CONTRAST adjusting value in the DEFLECTION ADJUST MODE, CONVERGENCE ADJUST MODE, and POINT CONVER ADJUST MODE.(Returns to the original adjusting value when the adjustment mode is exited.)
- Selects RED LOW-LIGHT in the WHITE BALANCE ADJUST MODE.

15) [B]

<Adjustment Mode>

- Selects "B" for ID SET and ID SELECT in the ID SET/CLEAR/ SELECT MODE.
- Selects H PIN in the DEFLECTION ADJUST MODE.
- Selects GREEN LOW-LIGHT in the WHITE BALANCE ADJUST MODE.

16) C

<Adjustment Mode>
- Selects "C" for ID SET and ID SELECT in the ID SET/CLEAR/SELECT MODE.
- Adds 10 to the current CONTRAST adjusting value in the DEFLECTION ADJUST MODE, CONVERGENCE ADJUST MODE, and POINT CONVER ADJUST MODE.(Returns to the original adjusting value when the adjustment mode is exited.)
- Selects BLUE LOW-LIGHT in the WHITE BALANCE ADJUST MODE.

17) D

<Adjustment Mode>
- Selects "D" for ID SET and ID SELECT in the ID SET/CLEAR/SELECT MODE.
- Selects GH LINEARITY in the DEFLECTION ADJUST MODE. (Note: This adjustment item is the same as GH LINEARITY in the convergence ADJUST MODE.)
- Selects ABL LEVEL in the WHITE BALANCE ADJUST MODE. (It is valid at COMBINATION=ON.)

18) E

<Adjustment Mode>
- Selects "E" for ID SET and ID SELECT in the ID SET/CLEAR/SELECT MODE.

19) F

<Adjustment Mode>
- Selects "F" for ID SET and ID SELECT in the ID SET/CLEAR/SELECT MODE.

20) R ADJ ON/OFF

<Adjustment Mode>
- Cyclically switches the adjusting color and direction between RH and RV in the CONVERGENCE ADJUST MODE.
- Selects the adjusting color RED in the POINT CONVER ADJUST MODE.

21) G ADJ ON/OFF

<Adjustment Mode>
- Cyclically switches the adjusting color and direction between GH and GV in the CONVERGENCE ADJUST MODE.
- Selects the adjusting color GREEN in the POINT CONVER ADJUST MODE.

22) B ADJ ON/OFF

<Adjustment Mode>
- Cyclically switches the adjusting color and direction between BH and BV in the CONVERGENCE ADJUST MODE.
- Selects the adjusting color BLUE in the POINT CONVER ADJUST MODE.

23) R ADJ ON/OFF

<Adjustment Mode>
- Cyclically switches RED ON/OFF in the DEFLECTION ADJUST MODE, CONVERGENCE ADJUST MODE, and POINT CONVER ADJUST MODE.

<Normal Mode>
- Sets the input function to VIDEO.

24) G ADJ ON/OFF

<Adjustment Mode>
- Cyclically switches GREEN ON/OFF in the DEFLECTION ADJUST MODE, CONVERGENCE ADJUST MODE, and POINT CONVER ADJUST MODE.

<Normal Mode>
- Sets the input function to Y/C.

25) B ADJ ON/OFF

<Adjustment Mode>
- Cyclically switches BLUE ON/OFF in the DEFLECTION ADJUST MODE, CONVERGENCE ADJUST MODE, and POINT CONVER ADJUST MODE.

<Normal Mode>
- Sets the input function to RGB.

26) INPUT SEL

<Normal Mode>
- Cyclically switches the input function in the following order.

$$\xrightarrow{} \text{VIDEO} \rightarrow \text{Y/C} \rightarrow \text{RGB} \circlearrowleft$$

27) ▲

<Adjustment Mode>
- Moves the convergence up in the POINT CONVER ADJUST MODE.

28) MAIN MENU

<Adjustment Mode>
- Returns the main menu of the adjustment mode.

29) [◄/−]

<Adjustment Mode>

- Decreases the adjusting value.
- Moves the convergence to the left in the POINT CONVER ADJUST MODE.

30) [+/►]

<Adjustment Mode>

- Increases the adjusting value.
- Moves the convergence to the right in the POINT CONVER ADJUST MODE.

31) [DISP CALL]

<Adjustment Mode>

- Turns on the test cross mark in the DEFLECTION ADJUST MODE, and CONVERGENCE ADJUST MODE.

<Normal Mode>

- Cyclically switches the status display in the ON/OFF.

32) [▼]

<Adjustment Mode>

- Moves the convergence down in the POINT CONVER ADJUST MODE.

33) [ADJ OUT]

<Adjustment Mode>

- Exits the adjustment mode.

34) LED for Confirming Transmission

② Performing Adjustments

1) Entering and exiting the adjustment mode

   Turn on the power switch and press the two [ADJ IN] keys of the remote control together. The adjustment mode will be set.

   To exit this mode, press the [ADJ OUT] key of the remote control. The normal screen will return.

2) Using the adjustment mode

   The following main menu will be displayed when the adjustment mode is entered.

– –

ADJUST

1.ID SET/CLEAR/SELECT
2.OPERATION MODE
3.DEFLECTION ADJ
4.CONVERGENCE ADJ
5.POIT CONVER ADJ
6.WHITE BALANCE ADJ
7.MEMORY READ/COPY

- Main Menu
  1) ID SET/CLEAR/SELECT mode
     Used for selecting, setting and clearing the ID.
  2) OPERATION mode
     Switches the setting such as input selection, ABL linkage ON/OFF, etc.
  3) DEFLECTION ADJ mode
     Adjusts the main deflection size, etc. (But all three colors RGB at once except GH LINEARITY.)
  4) CONVERGENCE ADJ mode
     Adjusts the convergence. (R, G, and B can be adjusted individually.)
  5) POINT CONVER ADJ mode
     Adjusts the convergence by point and zone convergence. (R,G,and B can be adjusted individually.)
  6) WHITE BALANCE ADJ mode
     Adjusts the white balance, color.
  7) MEMORY READ/COPY mode
     Adjusts the current value (both convergence and white balance) to the value set at shipment, and copy the convergence data between the memories.

③ Adjustment Examples

[1] Setting the ID

1) Enter the adjustment mode by [ADJ IN] key.
2) The main menu will be displayed. Press the [1] key to select [1. ID SET/CLEAR/SELECT].
3) Check that the ID display at the top left of the screen is [– –].

   Press the [1] key to select [1. ID SET].

   When an ID has already been provided, delete the ID as follows and perform from step 1).

   a) Press the [ADJ IN] key to set the adjustment mode. The main menu will be displayd.
   b) Press the [1] key and select [1. ID SET/CLEAR/SELECT].
   c) Press the [0] key to delete the ID.

4) The ID input standby state will be set. Use the [0] to [9] and [A] to [F] keys to input the ID.

5) If several units are used, return to step 1) and set the ID of the next unit.

[2] Entering the adjustment mode of certain units only.

1) Enter the adjustment mode.

2) Check that all the screens display the adjustment mode. Press the [1] key to select [1. ID SET/CLEAR/SELECT] of the main menu.

3) Another menu will be displayed. Press the [△2] key to select [2. ID SELECT].

4) Input the ID of the unit to be adjusted.

5) Only the unit corresponding to the ID input will display the main menu. All other units will be in the standby state.

6) Perform the usual adjustments.

7) ⓐ To continue adjusting the screen for which ID has been selected

Press the [MAIN MENU] key to return to the main menu.

ⓑEnding the adjustment mode

Press the [ADJ OUT] key and return to the NORMAL OPERATION MODE. Note)

ⓒAdjusting another unit

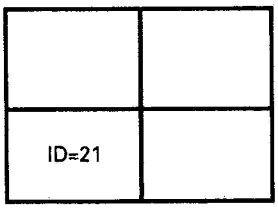
Repeat the mentioned operation 1) to 7).

Note) Even if a certain unit has timed-out and is shifting to the normal mode, be sure to perform one of the following steps a) or b) or c). If not, the unit for which ID SELECT has not been performed will remain in the standby state.

Example) When the ID=21 screen in the figure below is selected and left for more than 180 seconds without performing any operation:

Bottom left screen : Normal mode
Other screens : Standby state of the remote control adjustment mode.

To exit from these states, perform the following.



a) To continue adjustment

Press the [ADJ IN] key to set all screens into the remote control adjustment mode, and perform adjustments.

b) To end adjustments

Press the [ADJ OUT] key and exit from the remote control adjustment mode of screens in the standby state.

c) To turn OFF the power

Press the [POWER] key to turn OFF the power of all screens (STANDBY state).

[3] Adjusting the H SIZE

1) Enter the adjustment mode.

2) Press the [3] key to select [3. DEFLECTION ADJ].

3) Press the [5] key to select [H SIZE]. Then use the and keys to adjust the H PHASE.

The following can be adjusted using similar methods.

[0] key : V STATIC
[7] key : H BLK-L
[△2] key : V SIZE
[▽8] key : H BLK-R
[3] key : V MID SIZE
[9] key : V MID LINEARITY
[5] key: H SIZE
[B] key : H PIN
[▷6] key : V LINEARITY
[D] key : GH LINEARITY (is the same as GH LINEARITY in "4. CONVERGENCE ADJ".)

[4] Adjusting the green horizontal size (GH SIZE)

1) Enter the adjustment mode.

2) Press the [◁4] key to select [4. CONVERGENCE ADJ].

3) Press the [G ADJ ON/OFF] key until the OSD display becomes [GH].

The following can be adjusted in the same way.

[R ADJ ON/OFF] key : RH ←→ RV
[B ADJ ON/OFF] key : BH ←→ BV

4) Press the [△] key until the OSD display becomes [SIZE].

Then use the [◄/−] and [+/►] keys to adjust the GH SIZE.

The following can be adjusted in the same way.

[1] key : STATIC

[△] key : → SIZE → MID SIZE → 5D SIZE

[3] key : → LINEARITY → MID LINEARITY → 6D LINEARITY

[◁] key : → SKEW → 3D SKEW → 5D SKEW

[5] key : → KEY → MID KEY → 3D KEY → MID 3D KEY

[▷] key : → SUB KEY → MID SUB KEY → 3D SUB KEY → MID 3D SUB KEY

[7] key : → BOW → 4D BOW → 6D BOW

[▽] key : → PIN → MID PIN → 4D PIN → MID 4D PIN

[9] key : → SUB PIN → MID SUB PIN → 4D SUB PIN → MID 4D SUB PIN

[5] Adjusting the red point convergence

1) Enter the adjustment mode.
2) Press the [5] key to select [5. POINT CONVER ADJ] .
3) Press the [R ADJ ON/OFF] key so that only the blue of the screen is erased.

The following can be selected in the same way.

([G ADJ ON/OFF] : Green adjustment
[B ADJ ON/OFF] : Blue adjustment.)

4) Use the [△], [◁], [▷] and [▽] keys to move the OSD display to the point to be adjusted on the screen, and use the [▲], [▼], [◄/−] and [+/►] keys to adjust the convergence of that point.
5) Pressing the [0] key will select the area adjustment and point adjustment cyclically.

[6] Adjusting the red high light

1) Set the adjustment mode.
2) Press the [▷] key to select [6. WHITE BALANCE ADJ].
3) Press the [7] key to select [R HIGH]. And use the [◄/−] and [+/►] keys to adjust the red high light.

The following can be adjusted in the same way.

[0] key : ABL GAIN
[1] key : CONTRAST
[△] key : BRIGHT
[3] key : COLOR (Note 1)
[◁] key : TINT (Note 2)
[5] key : SHARPNESS (Note 1)
[▷] key : LINEAR WHITE
[7] key : R HIGH
[▽] key : G HIGH
[9] key : B HIGH
[A] key : R LOW
[B] key : G LOW
[C] key : B LOW
[D] key : ABL LEVEL (Note 3)

(Note 1) It is invalid for RGB input.
(Note 2) It is invalid for RGB and PAL input.
(Note 3) It is valid only at COMBINATION =ON.

[7] Turning on the peripheral light amount correction (MULTI)

1) Enter the adjustment mode.
2) Press the [△] key to select [2. OPERATION MODE] .
3) Press the [3] key to turn on/off the peripheral light amount correction (MULTI).

The following can be performed in the same way.

[△] key : Input selection (→ VIDEO → Y/C → RGB →)
[3] key : Peripheral light amount correction (ON ←→ OFF)
[◁] key : Color mode (1 ←→ 2)
[5] key : COMBINATION (ON ←→ OFF)
[▷] key : VIDEO MUTE (ON ←→ OFF)
[7] key : Baud rate selection (→ 1200BPS → 2400BPS → 4800BPS → 9600BPS → 19200BPS →)

[▽] key : TV system selection (→ AUTO → NTSC → PAL →)

[9] key : Convergence memory selection area switching

[8] To return the convergence and white balance adjustment data to that at shipment:

1) Set the adjustment mode.
2) Press the [7] key.
Select [7. MEMORY READ/COPY].
3) Select the number from the SUB MENU.
[1] key : The convergence and deflection adjustment data will return to that at shipment.
[△] key : The white balance adjustment data will return to that at shipment.

[9] To copy the convergence adjustment data between memories:

1) Set the adjustment mode.
2) Press the [7] key.
Select [7. MEMORY READ/COPY].
3) Press the [◁] key of the SUB MENU.
Select [4. CONV. MEMORY COPY].
4) Select the copy pattern (keys [1] to [6]).
5) If the copy pattern number is correct, press the [0] key within 5 seconds. (If not, the copy pattern will be displayed again.)
If the copy pattern number is wrong, press the [MAIN MENU] key and repeat from step 2 again.

[10] Resetting the setting

1) Set the adjustment mode.
2) Press the [7] key.
Select [7. MEMORY READ/COPY].

3) Press the [3] key of the SUB MENU.

As a result, the following settings will be set.

- MULTI (Peripheral light amount correction)=ON
- Baud rate=4800 bps
- COLOR MODE=1
- TV SYSTEM=AUTO
- VIDEO MUTE=OFF
- COMBINATION=OFF
- Convergence memory
  NTSC input (VIDEO, Y/C, RGB)=MEMO-1
  PAL input (VIDEO, Y/C, RGB)=MEMO-2
  Baud rate=4800 bps

The adjustments using the above settings can be performed very easily.

Example : When the baud rate of each projection unit is set to 2400 bps as they are not same.

①Press the [ADJ IN] key. (To set the adjustment mode).

②Press the [7] key (To select [7. MEMORY READ/COPY].)

③Press the [3] key (As the SUB MENU is selected, 4800 bps will be selected automatically.)

- To set the baud rate to 4800 bps, proceed onto step 7.

④Press the [▷] key. (Returns to the main menu).

⑤Press the [△] key (Select [2. OPERATION MODE]).

⑥Press the [7] key (As the baud rate changes cyclically, 2400 bps is selected.)

⑦Press the [ADJ OUT] key to select a baud rate.

The adjustment is completed.

④ Precautions Upon Use (Adjustment Control Unit)

- Always release the adjustment mode with [ADJ OUT] button and turn off the power with the [POWER] button after adjustments and settings. All adjusted values and settings will be memorized.

- The remote control adjustment mode will automatically be exited in the following.
  1. When no operations are performed for about 180 seconds.
  2. When the rear panel switch is pressed
  3. When the power is turned off
  4. When the input signal is switched, the cable is disconnected, or the mode is switched : NTSC ⟷ PAL. (However, in some cases, switching between PAL and no-signal may not exit the mode.)

- One multi-projection unit cannot be adjusted using the remote control unit and personal computer simultaneously. If using the remote control unit after the personal computer adjustment mode has been started up, start up the remote control unit adjustment mode or turn off the power once.

- When operating several multi-projection units simultaneously, do not press the buttons quickly and continuously as some units may not synchronize with the other units.

- Multi-projection units not assigned an ID cannot be operated using the remote control unit. To exit this state, perform one of the following.
  1. Start up the remote control adjustment mode using the [ADJ IN] button.
  2. Exit the remote control adjustment mode using the [ADJ OUT] button.
  3. Turn off the power.

- The remote control signal is output to the next unit via the link terminal only when a certain ID is set to the multi projection units. When operating several units, set this ID to all the units. Only units connected with the link cable located after the units to which the remote control unit is connected can be operated.

- Up to 16 units can be operated using the remote control at one time using the link cable. To operate more than 16 units, use a personal computer as well or reconnect the remote control.

- Handle the wire carefully.

Warning for Use of Dry Batteries ⚠

■ Using dry batteries incorrectly will result in battery liquid leakage, damage, etc. Take note of the following. (Also refer to precautions provided for dry batteries.)

- Load the ⊕ and ⊖ sides of the batteries correctly as shown on the battery case.
- Do not use old and new batteries together.
- Batteries of the same shape may have different voltages. Do not use different batteries together.
- When not using the unit for a long period of time (one month), remove the batteries to prevent battery liquid leakage.
  If leakage occurs, wipe the liquid thoroughly and load new batteries.
- Do not charge, short-circuit, disassemble, nor throw into fire the dry batteries provided.

9. REPLACING THE CRT ASSY

Serviceman Warning

When replacing the CRT assy,turn off the power,unplug the AC plug and let the unit discharge for more than 1 minute.

The anode cables of the CRT assy R,G and B in MULTIPROJECTION UNIT are connected in series as shown in Fig. 1.

When repracing the CRT assy,the anode cable have to be cut.

Note:

Since the anode cables for the CRT assy to service supplies are only available in half lengths,either cut longer lengths, or join older lengths of cable to ensure that the original cable length is used.

Table 1 Cable disconnecting methods

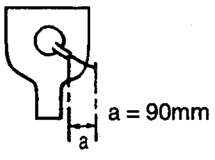
Cable	Replacement CRT assy		
	When CRT assy B is replaced	**When CRT assy G is replaced**	**When CRT assy R is replaced**
Cable ⓐ	—	—	Disconnect the anode cable from the FBT. (Refer to "8.1.3 ANODE VOLTAGE MEASURING METHOD")
Cable ⓑ	Leave it as is.	Cut a place 20mm from the exact center towards the CRT assy G.	Cut a place 20mm from the exact center towards the CRT assy R.
Cable ⓒ	Cut a place 20mm from the exact center towards the CRT assy B.	Cut a place 20mm from the exact center towards the CRT assy G.	Leave it as is.

Note: Do not cut other cables by mistake.

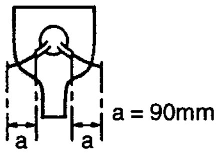
9.1 WHEN REPLACING THE CRT ASSY

Unplug the AC plug and let the unit discharge for more than 1 minute,then cut the anode cable according to Table 1.

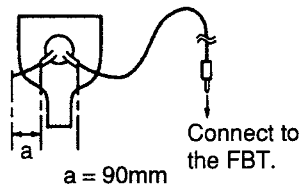
Each CRT assy supplied as a spare part is as shown below.



CRT ASSY B



CRT ASSY G



CRT ASSY R

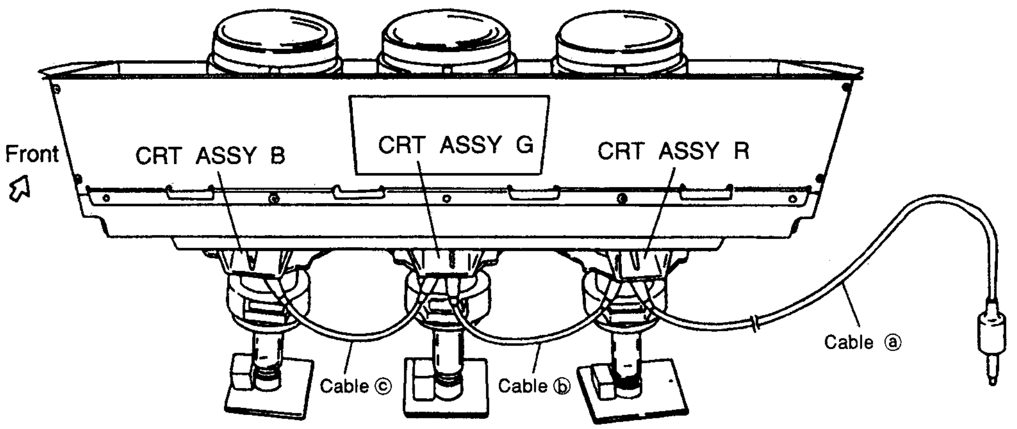
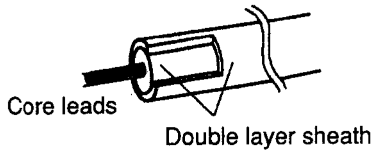
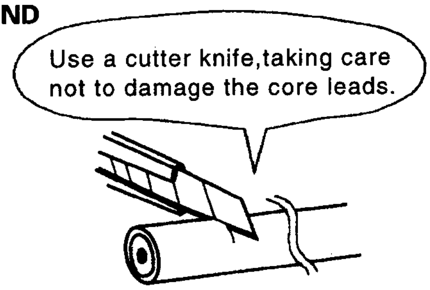
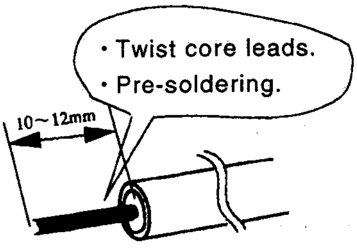


Fig. 1 Connection diagram of the CRT assemblies

■ANODE CABLE STRUCTURE AND SHEATH PEELING


Core leads
Double layer sheath


Use a cutter knife,taking care not to damage the core leads.

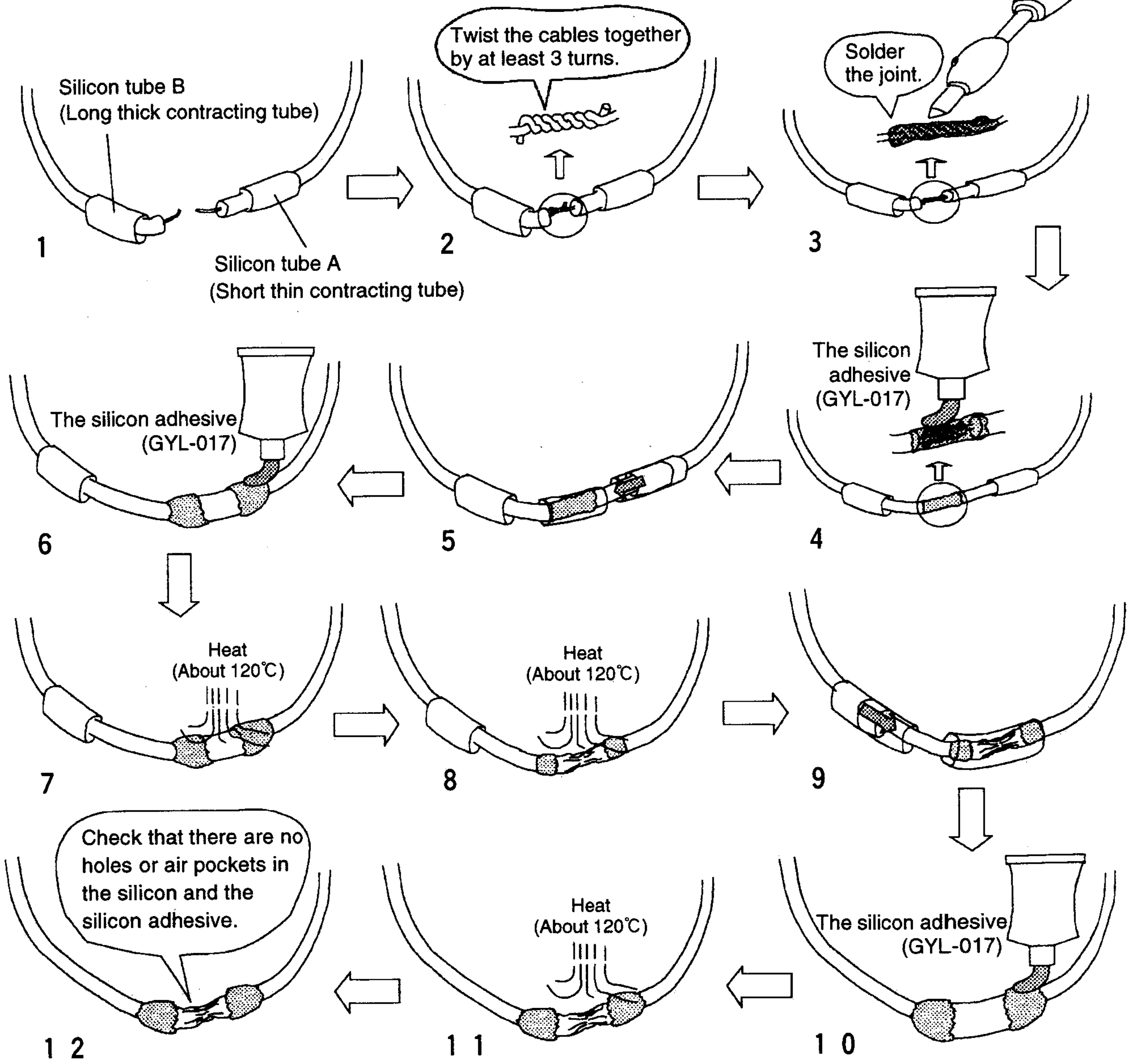

10~12mm
• Twist core leads.
• Pre-soldering.

■ANODE CABLE JOINING PROCEDURE

(The silicon tube is packed with CRT ASSY. For the silicon adhesive,be sure to use silicon adhesive part number GYL-017.)

●CAUTION When connecting the anode cable, pay attention to the following.

- Take care not damage the anode cable sheath.
- Insulate the cable core leads from other parts using the silicon adhesive and the silicon tube.
- Apply the silicon adhesive so that those are no air gaps.


1
Silicon tube B
(Long thick contracting tube)
Silicon tube A
(Short thin contracting tube)
2
Twist the cables together by at least 3 turns.
3
Solder the joint.
4
The silicon adhesive (GYL-017)
5
6
The silicon adhesive (GYL-017)
7
Heat (About 120℃)
8
Heat (About 120℃)
9
10
The silicon adhesive (GYL-017)
11
Heat (About 120℃)
12
Check that there are no holes or air pockets in the silicon and the silicon adhesive.

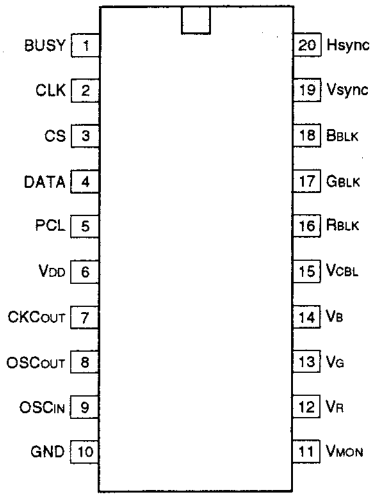
10. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

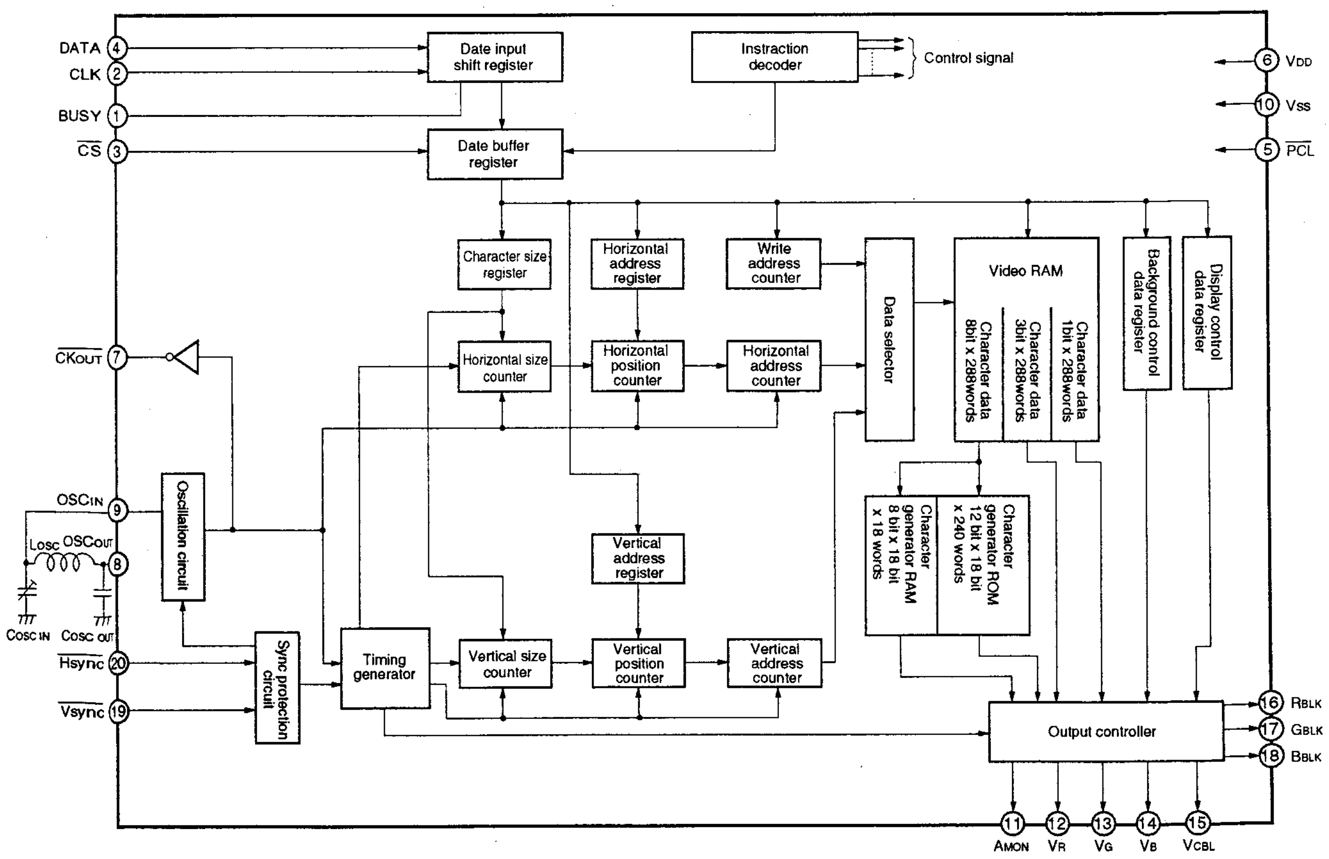
■ µPD6453CY-001 (IC1003)

For on screen character display

● Pin Arrangement (Top view)


BUSY 1
CLK 2
CS 3
DATA 4
PCL 5
VDD 6
CKCOUT 7
OSCOUT 8
OSCIN 9
GND 10
20 Hsync
19 Vsync
18 BBLK
17 GBLK
16 RBLK
15 VCBL
14 VB
13 VG
12 VR
11 VMON

● Block Diagram


DATA 4
CLK 2
BUSY 1
CS 3
CKOUT 7
OSCIN 9
Losc OSCOUT 8
CoscIN Cosc OUT
Hsync 20
Vsync 19
Date input shift register
Instraction decoder
Control signal
6 VDD
10 Vss
5 PCL
Date buffer register
Character size register
Horizontal address register
Write address counter
Data selector
Video RAM
Character data 8bit x 288words
Character data 3bit x 288words
Character data 1bit x 288words
Background control data register
Display control data register
Horizontal size counter
Horizontal position counter
Horizontal address counter
Oscillation circuit
Character generator RAM 8 bit x 18 bit x 18 words
Character generator ROM 12 bit x 18 bit x 240 words
Vertical address register
Sync protection circuit
Timing generator
Vertical size counter
Vertical position counter
Vertical address counter
Output controller
16 RBLK
17 GBLK
18 BBLK
11 AMON
12 VR
13 VG
14 VB
15 VCBL

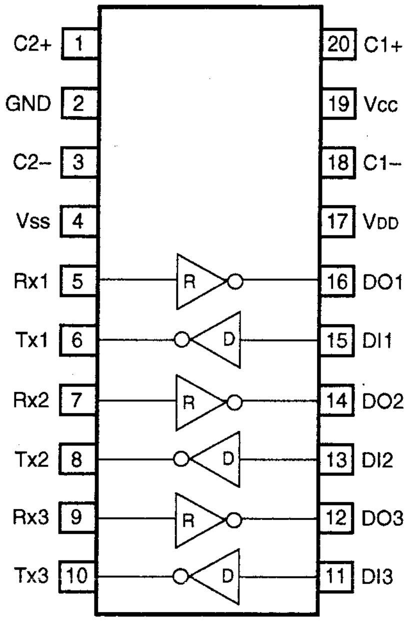
- **Pin Finction**

Pin No.	SOMBOL	NAME	FUNCTION
1	BUSY	BUSY signal output pin	Serial data input enable/disable state detection pin. Input is enabled when low.
2	CLK	Clock input pin	Clock input pin for reading data. Data added to DATA pin is read at rising edge of clock.
3	$\overline{\text{CS}}$	Chip select pin	When set from high to low, serial transfer is acknowledged.
4	DATA	Serial data input pin	Control data input pin.
5	$\overline{\text{PCL}}$	Power on clear pin	Clears when power is turned on. Set from low to high when turning on power. Starts up VRAM collective release and exists from test mode.
6	VDD	Power supply pin	Supplies power (+5V).
7	$\overline{\text{CKOUT}}$	Clock out pin	OSCOUT inverse output.
8	OSCOUT	LC oscillation input/ output pin	Dot clock generation oscillator input and output pin. Connected to oscillation coil and capacitor.
9	OSCIN		
10	Vss	GND pin	Connected to system's GND.
11	VMON	Character signal monitor output pin	Outputs positive VR, VG, and VB composite signals.
12	VR	Character signal output pin	Output pin of character signals corresponding to color signals R, G, B. Positive signal output.
13	VG		
14	VB		
15	VCBL	Composite blanking output pin	Blanking signal output pin for cutting video signal. Color blanking 3-output composite signal.
16	RBLK	Character signal blanking output pin	Blanking signal output pin for cutting video signal. RBLK, GBLK, and BBLK correspond to signal outputs VR, VG, and VB. Positive signal output.
17	GBLK		
18	BBLK		
19	$\overline{\text{VSYNC}}$	Vertical sync signal input pin	Input at negative sync.
20	$\overline{\text{HSYNC}}$	Horizontal sync signal input pin	Dot clock oscillator synchronizes with rising edge of this signal and oscillates when high level. Input at negative sync.

■ MC145407P (IC1005)

5V-single RS232D transceiver

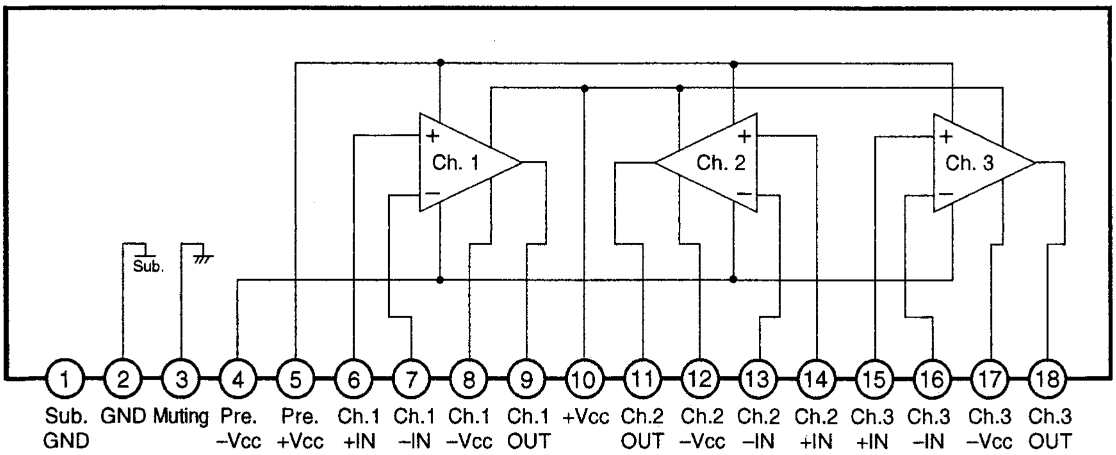
- **Pin Arrangement (Top view)**


C2+ 1
GND 2
C2– 3
Vss 4
Rx1 5
Tx1 6
Rx2 7
Tx2 8
Rx3 9
Tx3 10
20 C1+
19 Vcc
18 C1–
17 VDD
16 DO1
15 DI1
14 DO2
13 DI2
12 DO3
11 DI3
R
D
R
D
R
D

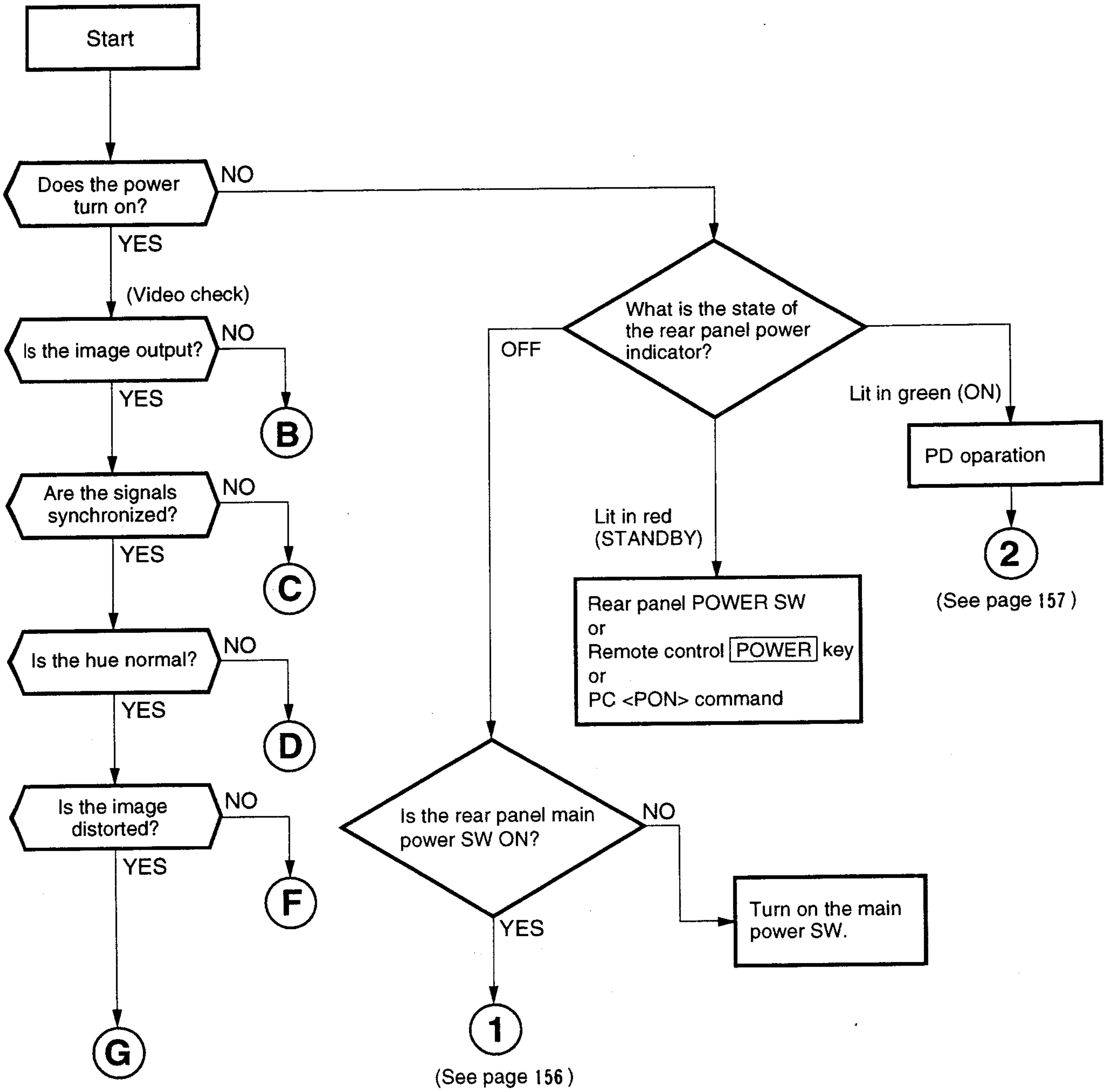
■ STK392-110 (IC4503, IC4504)

POWER AMP FOR CONVERGENCE ADJUST (3CH)

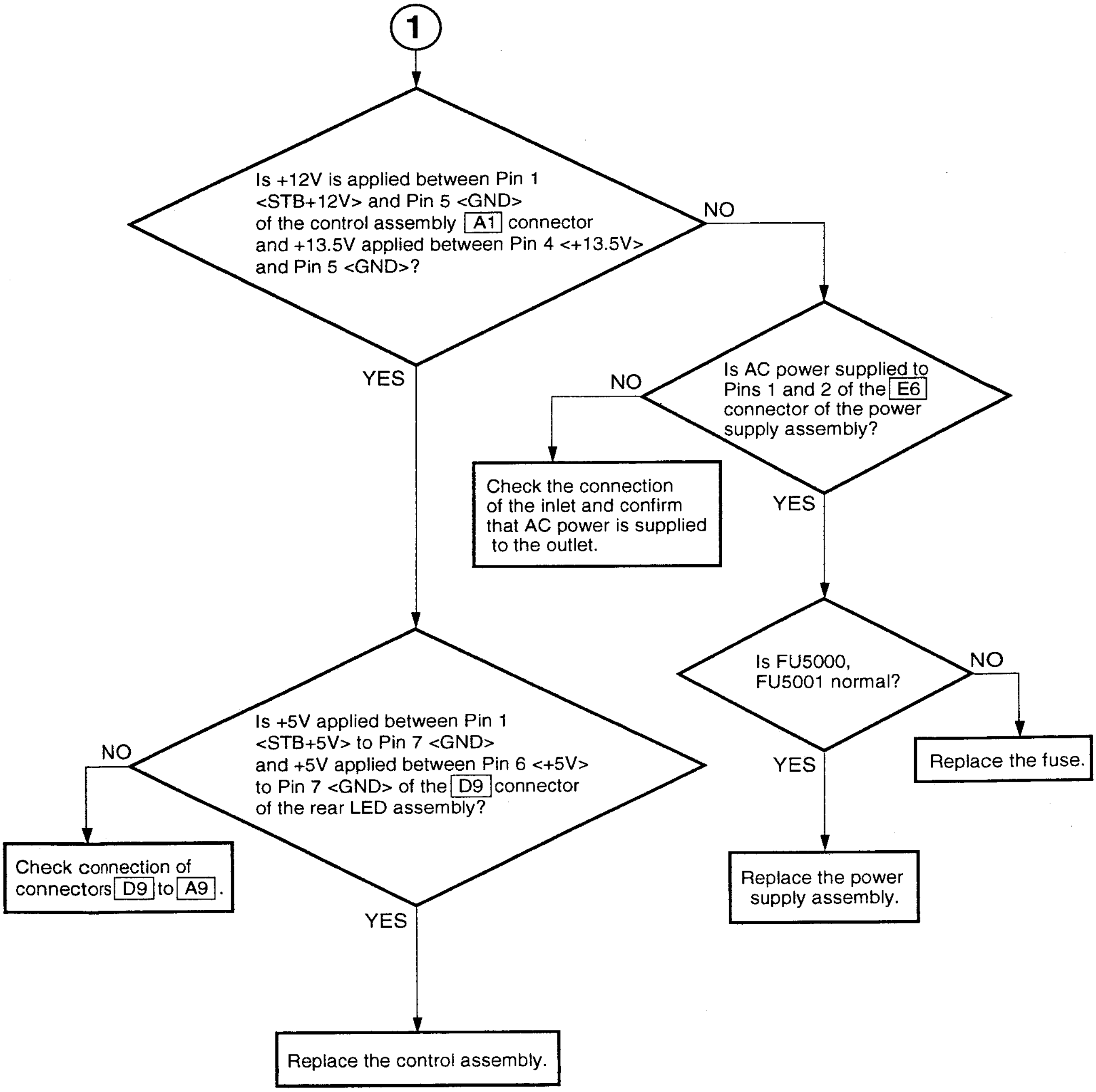
- **Block Diagram**

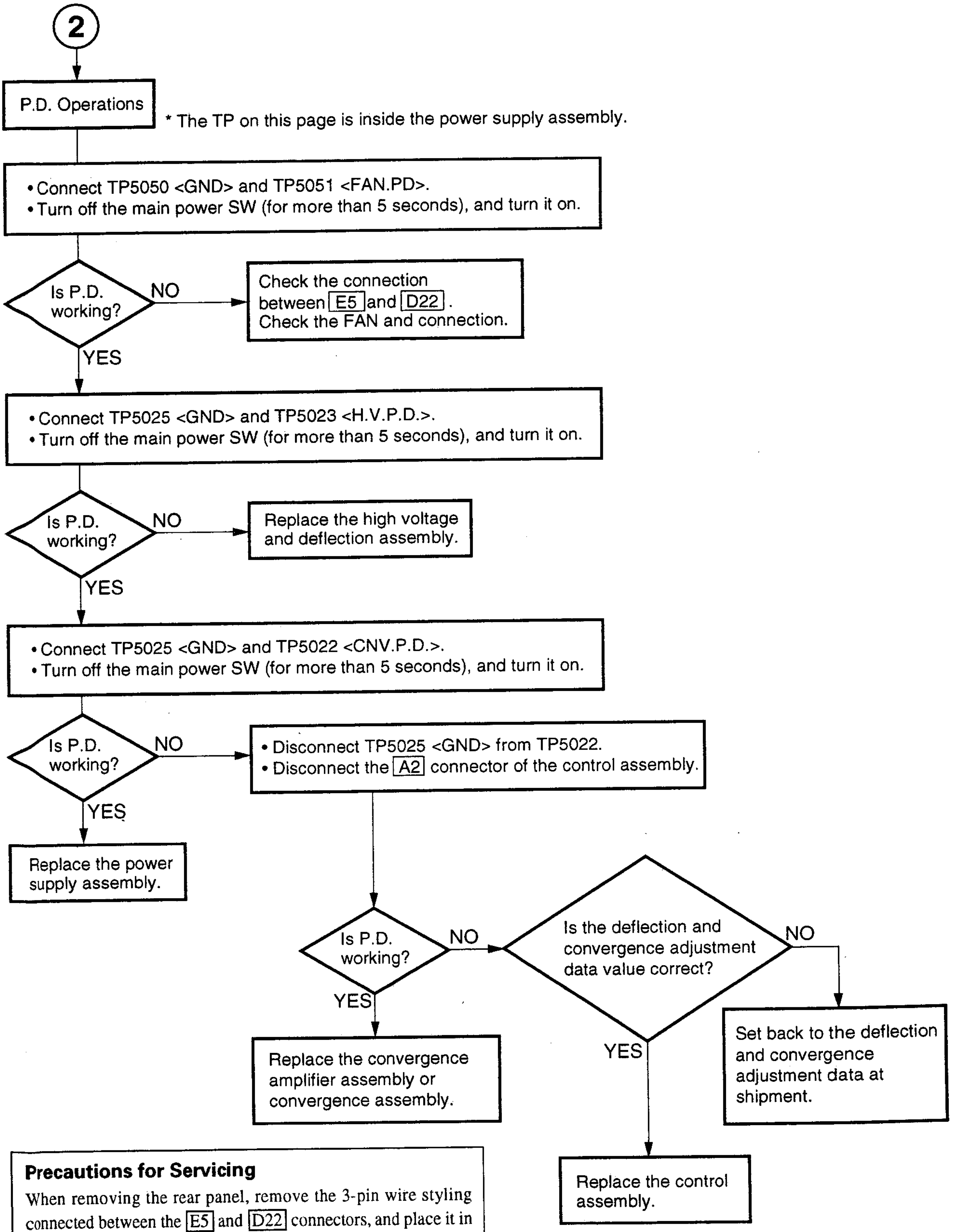

Ch. 1
Ch. 2
Ch. 3
+
–
Sub.
1 Sub. GND
2 GND
3 Muting
4 Pre. –Vcc
5 Pre. +Vcc
6 Ch.1 +IN
7 Ch.1 –IN
8 Ch.1 –Vcc
9 Ch.1 OUT
10 +Vcc
11 Ch.2 OUT
12 Ch.2 –Vcc
13 Ch.2 –IN
14 Ch.2 +IN
15 Ch.3 +IN
16 Ch.3 –IN
17 Ch.3 –Vcc
18 Ch.3 OUT

11. TROUBLESHOOTING


Start
Does the power turn on?
NO
YES
(Video check)
Is the image output?
NO
YES
B
Are the signals synchronized?
NO
YES
C
Is the hue normal?
NO
YES
D
Is the image distorted?
NO
YES
F
G
What is the state of the rear panel power indicator?
OFF
Lit in green (ON)
PD oparation
2
(See page 157)
Lit in red (STANDBY)
Rear panel POWER SW
or
Remote control POWER key
or
PC <PON> command
Is the rear panel main power SW ON?
NO
Turn on the main power SW.
YES
1
(See page 156)

Note : When performing video checks, always make sure the video signal is on the input terminal.


1
Is +12V is applied between Pin 1 <STB+12V> and Pin 5 <GND> of the control assembly A1 connector and +13.5V applied between Pin 4 <+13.5V> and Pin 5 <GND>?
NO
YES
Is AC power supplied to Pins 1 and 2 of the E6 connector of the power supply assembly?
NO
Check the connection of the inlet and confirm that AC power is supplied to the outlet.
YES
Is FU5000, FU5001 normal?
NO
Replace the fuse.
YES
Replace the power supply assembly.
Is +5V applied between Pin 1 <STB+5V> to Pin 7 <GND> and +5V applied between Pin 6 <+5V> to Pin 7 <GND> of the D9 connector of the rear LED assembly?
NO
Check connection of connectors D9 to A9.
YES
Replace the control assembly.

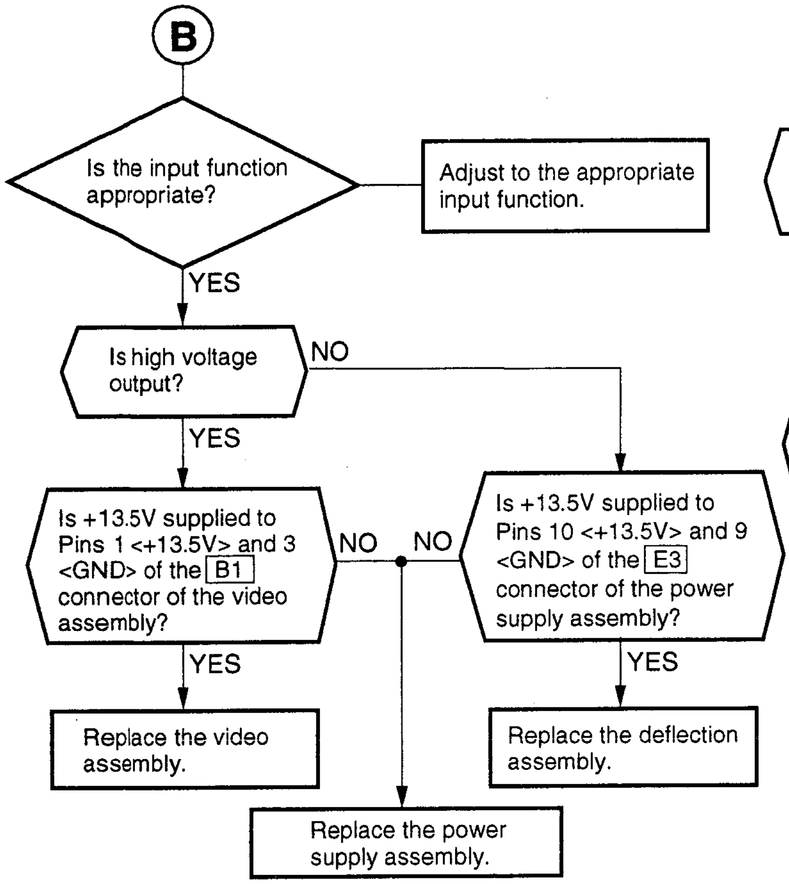

2
P.D. Operations
• Connect TP5050 <GND> and TP5051 <FAN.PD>.
• Turn off the main power SW (for more than 5 seconds), and turn it on.
Is P.D. working?
NO
Check the connection between E5 and D22.
Check the FAN and connection.
YES
• Connect TP5025 <GND> and TP5023 <H.V.P.D.>.
• Turn off the main power SW (for more than 5 seconds), and turn it on.
Is P.D. working?
NO
Replace the high voltage and deflection assembly.
YES
• Connect TP5025 <GND> and TP5022 <CNV.P.D.>.
• Turn off the main power SW (for more than 5 seconds), and turn it on.
Is P.D. working?
NO
• Disconnect TP5025 <GND> from TP5022.
• Disconnect the A2 connector of the control assembly.
YES
Replace the power supply assembly.
Is P.D. working?
NO
YES
Replace the convergence amplifier assembly or convergence assembly.
Is the deflection and convergence adjustment data value correct?
NO
Set back to the deflection and convergence adjustment data at shipment.
YES
Replace the control assembly.

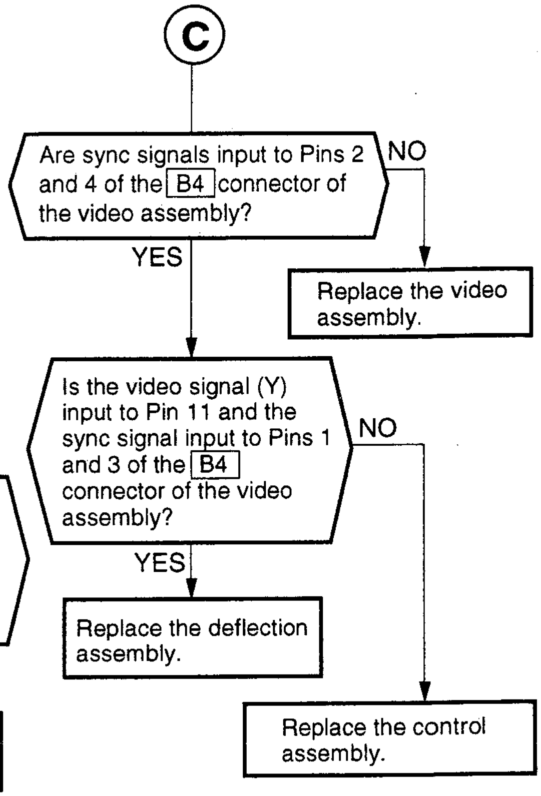
* The TP on this page is inside the power supply assembly.

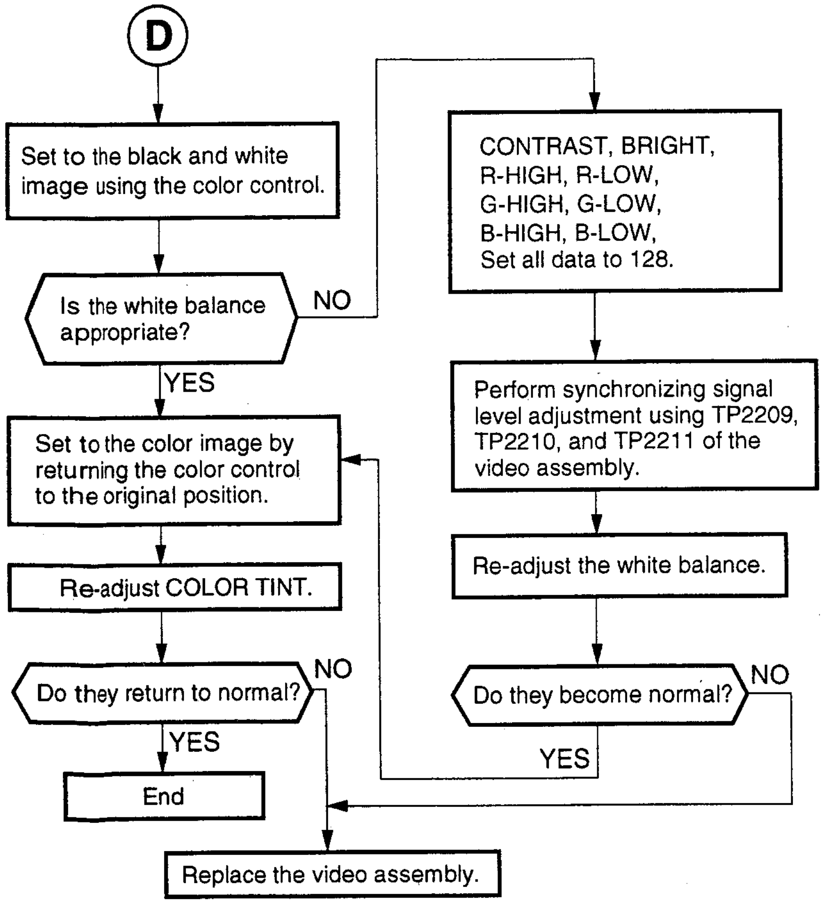
Precautions for Servicing

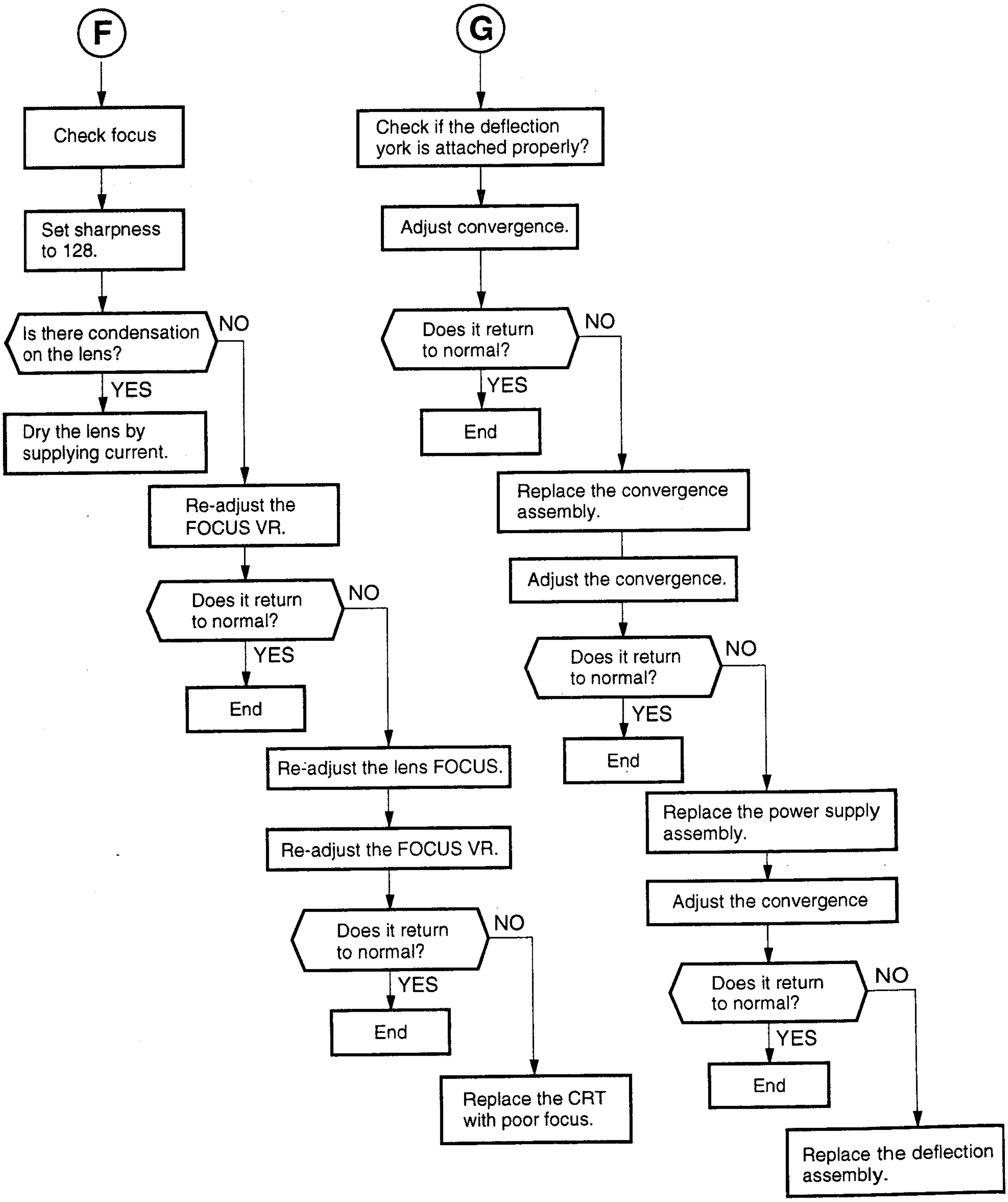
When removing the rear panel, remove the 3-pin wire styling connected between the E5 and D22 connectors, and place it in the space at the left side as seen from the rear.
If disconnecting the D22 connector, connect TP5050 <GND> and TP5051 <FAN P. D.> inside the power supply assembly, or the FAN P. D. will operate and the unit cannot be turned on.

Note : To prevent burning of the CRT, stop the operations of P. D. by disconnecting 4P <HT+> and 5P <HT–> of the high voltage and deflection assembly C2 connector.


B
Is the input function appropriate?
Adjust to the appropriate input function.
YES
Is high voltage output?
NO
YES
Is +13.5V supplied to Pins 1 <+13.5V> and 3 <GND> of the B1 connector of the video assembly?
NO
NO
Is +13.5V supplied to Pins 10 <+13.5V> and 9 <GND> of the E3 connector of the power supply assembly?
YES
Replace the video assembly.
YES
Replace the deflection assembly.
Replace the power supply assembly.

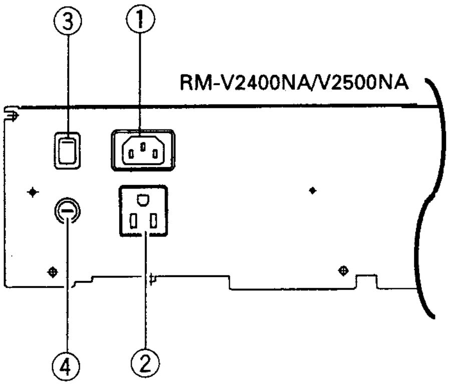

C
Are sync signals input to Pins 2 and 4 of the B4 connector of the video assembly?
NO
YES
Replace the video assembly.
Is the video signal (Y) input to Pin 11 and the sync signal input to Pins 1 and 3 of the B4 connector of the video assembly?
NO
YES
Replace the deflection assembly.
Replace the control assembly.

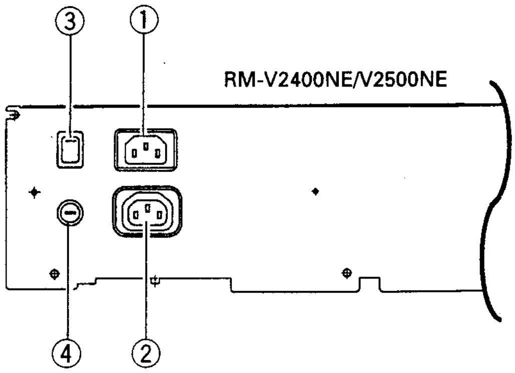

D
Set to the black and white image using the color control.
CONTRAST, BRIGHT, R-HIGH, R-LOW, G-HIGH, G-LOW, B-HIGH, B-LOW, Set all data to 128.
Is the white balance appropriate?
NO
YES
Perform synchronizing signal level adjustment using TP2209, TP2210, and TP2211 of the video assembly.
Set to the color image by returning the color control to the original position.
Re-adjust the white balance.
Re-adjust COLOR TINT.
Do they return to normal?
NO
Do they become normal?
NO
YES
YES
End
Replace the video assembly.


F
Check focus
Set sharpness to 128.
Is there condensation on the lens?
NO
YES
Dry the lens by supplying current.
Re-adjust the FOCUS VR.
Does it return to normal?
NO
YES
End
Re-adjust the lens FOCUS.
Re-adjust the FOCUS VR.
Does it return to normal?
NO
YES
End
Replace the CRT with poor focus.
G
Check if the deflection york is attached properly?
Adjust convergence.
Does it return to normal?
NO
YES
End
Replace the convergence assembly.
Adjust the convergence.
Does it return to normal?
NO
YES
End
Replace the power supply assembly.
Adjust the convergence
Does it return to normal?
NO
YES
End
Replace the deflection assembly.

12. PANEL FACILITIES

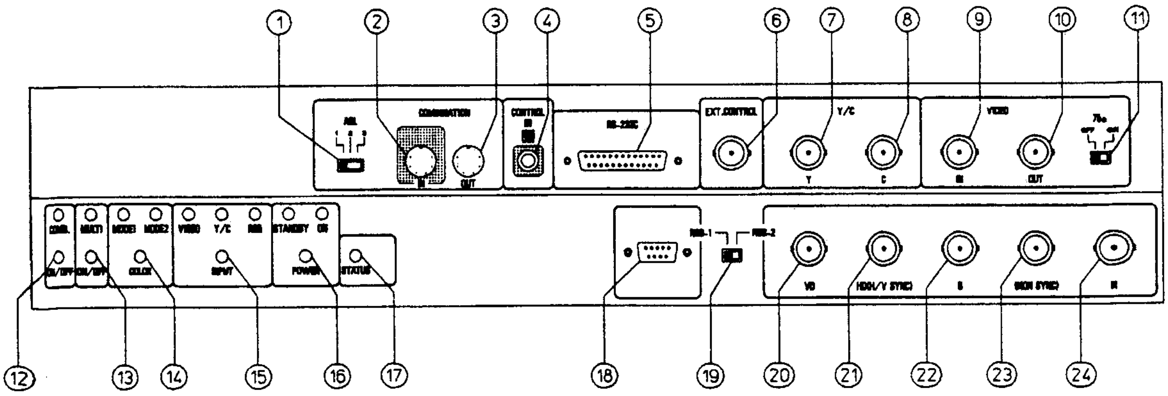
Power Supply Panel


③
①
RM-V2400NA/V2500NA
④
②


③
①
RM-V2400NE/V2500NE
④
②

No.	Name	Type	Function
①	AC inlet		Connects AC power cord.
②	AC outlet		Connects other multi-projection units. Not linked to main power switch.
③	Main power switch	See-saw switch	Turns on and off the power supplied to the main unit. Sets into the standby state when turned on.
④	Fuse holder		Stores the fuse. No-one except serviceman should touch this part.

Control Panel


①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
AGL
1 2 3
COMBINATION
IN
OUT
CONTROL
IN
RS-232C
EXT.CONTROL
Y/C
Y
C
VIDEO
IN
OUT
75Ω
OFF ON
CONTL
ON/OFF
MULTI
ON/OFF
MODE1
MODE2
COLOR
VIDEO
Y/C
RGB
INPUT
STANDBY
ON
POWER
STATUS
RGB-1
RGB-2
VD
HD(H/V SYNC)
B
G(ON SYNC)
R
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
㉑
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㉔

No	Name	Type	Function
①	ABL link switch	Slide switch	Used for switching the control level of the ABL link control voltage when ABL link is ON.
②	Linked input terminal	DIN 6PIN	Input terminal of ABL signal, remote control signal and RS-232C signal
③	Linked output terminal	DIN 6PIN	Output terminal of ABL signal, remote control signal, and RS-232C signal
④	Remote control connection terminal	Mini jack	Connected to adjusting remote control (optional)
⑤	RS-232C port	D-sub 25 PIN (Female)	RS-232C communication connector
⑥	Control input terminal	BNC connector	Video input and Y/C input external switching control signal input terminal (Normal(video signal input) : Open Select Y/C input : Low(0V)
⑦	Y (Luminance) input terminal	BNC connector	Luminance signal input terminal
⑧	C (Color) input terminal	BNC connector	Color signal input terminal
⑨	Video input terminal	BNC connector	Video signal input terminal
⑩	Video output terminal	BNC connector	Video input terminal ⑨ through-out terminal
⑪	TERMINATE switch	Slide switch	Turns on when terminates the video input terminal ⑨ at 75 ohm
⑫	COMBINATION switch	Tact switch	Turns on when linked to ABL
⑬	MULTI switch	Tact switch	Turns on when used on multi screen
⑭	COLOR MODE switch	Tact switch	Switches the color temperature. 1:Normal use. 2:Re-exposure
⑮	INPUT switch	Tact switch	Switches VIDEO input, Y/C input, RGB input. Switches VIDEO input and Y/C input with the external control signal ⑥ at VIDEO position
⑯	POWER switch	Tact switch	Power OFF : STANDBY (Red LED) lights up Power ON : ON (Green LED) lights up
⑰	STATUS switch	Tact switch	Accumulated duty time: * Switch which displays setting states of each switch on the screen.
⑱	RGB input terminal	D-sub 9PIN (Male)	RGB signal input terminal
⑲	RGB input select switch	Slide switch	Switches RGB signal input terminal type
⑳	RGB input terminal (Vertical sync)	BNC connector	RGB signal vertical sync input terminal
㉑	RGB input terminal (Horizontal sync/composite sync)	BNC connector	RGB signal horizontal sync and composite sync (Only for input signal H/V sync) input terminal
㉒	RGB input terminal (B)	BNC connector	RGB signal B input terminal
㉓	RGB input terminal (G/composite sync)	BNC connector	RGB signal G and composite sync (Input signal G on sync) input terminal
㉔	RGB input terminal (R)	BNC connector	RGB signal R input terminal

- To turn off the power, use the POWER switch - of the unit, the RS-232C control, or wired remote control (optional). (If turned off using the main POWER switch or by disconnecting the power cable from the outlet, the settings of the above ⑫ to ⑮ switches and the state of the TV SYSTEM and convergence memory will not be recorded on the memory.)
  Consequently when starting up or stopping the whole system by AC ON/OFF in setup conditions for a demonstration, it is necessary to turn off the power using the above method to record each setting in the memory.
  (Refer to "8.2 POINT CONVERGENCE ADJUSTMENT MODE (5)Equipment Required for Adjustments".)

* : Accumulated duty time
  Counts only when the power is ON.

13. SPECIFICATIONS

Multi Projection Unit (RM-V2400N/V2500N)

TV format .... NTSC, PAL automatic selection
(Each mode provided)
Projection tube 7-inch CRTx3
Horizontal resolution 800 TV lines (In video input mode)*1
Luminance (For white peak) .... 600ft-L(40-inch)*1
.... 420ft-L(50-inch)*1
Practical visible .... angle Horizontal direction 150 deg
Vertical direction 60 deg *1
Input signals:
  Video input; Standard input level (75 ohm load) 1 Vp-p
  Input terminal:BNC connectorx1
  Y/C separation input; Standard input level (75 ohm load)
  Luminance (Y) signal 1 Vp-p (With sync signal)
  Color (C) signal:286 mVp-p (Burst signal <NTSC>)
  300 mVp-p (Burst signal <PAL>)
  Input terminal:BNC connector (Y and Cx1 each)
  RGB input.................................. Analog R, G, B signals
  RGB-1 : D-Sub 9-pin connectorx1*3
  RGB-2 : BNC connectorx5*3
  R:Red input .... 0.7 Vp-p±2dB,
  terminated at 75 ohm, positive polarity
  G/G SYNC:Green input .... 0.7 Vp-p±2dB,
  terminated at 75 ohm, positive polarity
  Green input with SYNC .... 0.7 Vp-p±2dB,
  terminated at 75 ohm, positive polarity
  B:Blue input .... 0.7 Vp-p±2dB,
  terminated at 75 ohm, positive polarity
  SYNC/HD:Composite sync input .... 0.3Vp-p to 4Vp-p,
  terminated at 75 ohm, negative polarity
  Horizontal sync input: .... 0.3Vp-p to 4Vp-p,
  terminated at 75 ohm, negative polarity
  VD:Vertical sync input: .... 0.3Vp-p to 4 Vp-p,
  terminated at 75 ohm, negative polarity
  Sync. signal frequency: Frequency is in accordance with NTSC or PAL.
  EXT control:BNC connector
  Remote input:Mini jack
  Linked input:6PIN DIN connector
Output signal
  Video output .... Standard level (75 ohm load) 1 Vp-p
  Outputs input signal from input terminal
  Remote output................................ 6PIN DIN connector

Computer control:
  Method .... RS-232C (D-SUB 25PIN)
  Speed 1200, 2400, 4800, 9600, 19200 BPS*2
Power supply voltage
  for RM-V2400NA/V2500NA ... AC100V to 120V, 50/60Hz
Power supply voltage
  for RM-V2400NE/V2500NE .... AC220V to 240V, 50/60Hz
Normal Consumption power
  for RM-V2400NA/V2500NA .... approx. 360 VA*4
Normal Consumption power
  for RM-V2400NE/V2500NE .... approx. 240 W*4
Maximum Consumption power
  for RM-V2400NA/V2500NA 400VA
Maximum Consumption power
  for RM-V2400NE/V2500NE 275W
AC outlet (Max. 8A, AC100V to 120V)
  for RM-V2400NA/V2500NA ....× 1
AC outlet (Max. 550W, AC220V to 240V)
  for RM-V2400NE/V2500NE ....× 1
External dimensions .... 680 (W)x490 (H)x545 (D) mm
Weight .... 38 kg (Main unit)
Accessories
  Power cord .... × 1
  Cable clip .... × 1
  Screw .... × 1
  Control cable (ABL link cable) ....× 1
  *Used for controlling several multi-projection units.

*1 Projection Screen Kit(RMS-V4011/V5011)
Projection Frame(RMF-V4011/V5011)
Specifications when installed as specified above.

*2 The RS-232C baud rate is set to 4800BPS before shipment. The baud rate is controlled by Remote control unit or a personal computer.

*3 Either RGB1 or 2 is used by switch selection.

*4 For NTSC or PAL COLOR BAR signal input and each adjustment data is shipment condition.